RAILROAD GAZETTE

FRIDAY, AUGUST 7.

CONTENTS.

Contributions.

The Inter-Continental Railroad.

NEW YORK, July 31, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your correspondent from Peru gives the first note of warning I have seen that we must not expect more than a "reconnaissance" to result from the labors of the Pan-American railroad expedition. Alas, if we only get *that much* from the party that has gone south from Quito we may be thankful! His suggestions of cannibals and mummied heads are very funny. What a pity that somebody in that party didn't read "La Condamine" before starting. His hints would have been invaluable for this expedition.

PERU.

Injection Check Valves.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your editorial, July 17, on safety checks for locomotive boilers, and wish to emphasize same by saying that the Pennsylvania Railroad, which is in matters of safety probably the most progressive road in this country, has adopted the McDowell, or, as it is sometimes called, the Hayward check, for its entire locomotive equipment, after having it redesigned at Altoona. It was shown that the ordinary checks were dangerous and caused serious injury to freight-train hands in wrecks, and there was no good reason for their continued use. It was also found that the new check renders injury by scalding in wrecks from breakage of locomotive checks practically impossible.

LOCOMOTIVE.

Where Safety Was Luck.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have seen the communication in your issue of July 31 signed Red Light. The complaint seems to be that tracks were obstructed without sending out a flagman. This is undoubtedly bad practice unless some other precautions are taken, but before passing judgment upon the road or its employés it might be well to get some additional evidence, for instance, the time card or the file of general orders, either of which might and probably would be found to contain instructions which would make the manner of setting off the cars not only permissible but perfectly safe.

It is not fair to convict upon part of the evidence when the rest is so easy to obtain, and I think that on any railroad which has grown to the dignity of a double track it is safe to say of any operation, no matter how it may look, that all precautions have been taken, until evidence is produced that shows they have not.

SEMAPHORE.

The Transition Spiral.

PORT JERVIS, N. Y., Aug. 5, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It may be of interest to the readers of your abstract of Prof. Talbot's article on "The Transition Spiral" to know that this Holbrook spiral has been used in realignment work on the Erie for several years. Our formulas differ in notation from Prof. Talbot's, and also in the numerical factors in the equations for x and y, but it is practically the same curve.

For ordinary use, we on the Delaware Division have tabulated a series of 6 spirals, in which a varies from 1⅜ to 3⅛, or from 60 ft. to 30 ft. per degree of curve, but we have used 15 ft. and 12 ft. ($a = 6⅜$ and $8⅛$). Our 15-ft. spirals are satisfactory for a speed of 40 miles per hour, and for a speed of 60 miles per hour or less the 60-ft. spiral makes it difficult to locate the extremities of the curve within 100 ft. from the motion of the car alone.

The good effects of the spiral are quite as great between arcs of heavy compounds as between tangent and curve. Their use greatly relieves the discomfort in riding due to curves, and, if applied to all curves, would practically remove it. With an alignment 60 per cent. of which is curved, financial considerations have limited our re alignment work, and we try to be contented with moderate progress, taking every opportunity to add the spiral ends to our curves.

E. T. REISLER.

Train Speeds and State Control.

LONDON, July 21, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

It would be very unbecoming in me to seem to cavil at any statement appearing in a paper for which I have such a respect as the *Railroad Gazette*. But in your editorial comments of July 10 you draw a conclusion that wise state control would fix "a minimum time between termini." This is one of the very points which my letter to the *London Times*, which the *Railway News* reproduced, was designed to oppose.

I maintain that a state commission is the very worst body which can be imagined to interfere with the working of the traffic of any road. In my opinion speed ought essentially to be a question for the officers of the road to settle, and I also think that the United States have advanced in railroad methods because no definite, stereotyped system of safety appliances has been enforced by government.

How, then, you may ask, is the public safety to be assured? In my opinion this should be done by strengthening the common-law remedies for criminal neglect; by making directors criminally responsible for accidents caused by lack of reasonable safety appliances; and, if necessary, by having a legal court of technical railroad men to settle whether neglect was or was not criminal in any particular case.

The point which I am aiming at is the very old Anglo-Saxon principle of letting people manage their own business, subject to the common law of the land, which should be amended, if necessary, to protect the public.

Once we accept the opposite view, viz., that our grandmother, the state, is to settle for us what is and what is not safe, it appears to me that this principle, carried out to its logical end, must lead to state management, for which system of railroading there is of course much to be said, but at the same time I believe that the *Railroad Gazette* does not favor such a system.

For what body of commercial men will invest money in new roads if they are to be at the mercy of a government inspector, who cannot by any possibility know what amount of traffic is being daily dealt with, but who has power suddenly to order them to spend enormous sums in what he considers "safety appliances"?

Finally, I do not quite agree, from a technical point of view, that speed is the greatest source of danger. In my opinion excess of traffic and want of discipline in a staff are even more serious dangers. Is your government bureau to manage the railroad company's men and to limit the traffic? If so, why not call it a government railroad at once?

T. C. FARRER.

The Railroad Bridge Failure at Moenchenstein.

PITTSBURGH, Pa., July 29, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The engineering journals and newspapers have already published a number of articles and criticisms on the recent bridge failure at Mönchenstein, in Switzerland. All seem inclined to attribute the bridge catastrophe rather to the breakdown of the bridge for want of sufficient strength than to the derailment of the train. The *Railroad Gazette* gives in its edition of July 17 a detailed description of the disaster, as well as of the constructive features of the bridge; it also publishes an opinion of Gustave Mantel, a Zürich engineer, as to the probable cause of the failure.

One principal, though not the immediate, cause of the collapse of the bridge I would find in the faulty "bridge system" which was used for said bridge.

The trusses of this bridge system, called "System Neville," are of the triangular type with comparatively long panels, which are again subdivided by ties or suspenders. In a through bridge these suspenders carry the panel load of the intermediate floorbeams, and by them they are connected to the panel points of the upper chord. If a train passes over a bridge of this kind with great velocity the suspenders will alternately receive their maximum and minimum strains very suddenly, thus rendering heavy shocks on the corresponding panel points unavoidable. This does not happen on a bridge truss in which the verticals are actual truss members and firmly connected to the floorbeams. These verticals gradually receive their maximum and minimum strains, which is usually only once during one passage of a train over the bridge. It is evident that these sudden shocks cause vibration in the members, loosen the joints and shorten the life of such a triangular-shaped bridge quicker than they would that of a truss bridge, in which the auxiliary members (suspenders) are dispensed with. These "Neville trusses" were very frequently constructed in Belgium, France, Italy, Switzerland, and especially in Austria, even when such a prominent engineer as Prof. Cullmann had severely critisised them in 1852 for their lack of rigidity, after having made a close study and many observations of the systems of this country.

The bridge sustained an accident as early as 1881, and was left resting on three points during a washout of one abutment. This naturally caused a distortion of the entire bridge; several members were twisted and were afterward partly re-enforced and exchanged for new ones. A bridge having such an experience should certainly have been condemned and replaced with a new one, as no one could tell which parts were in a defective condition and which were not. There were no brackets or knee braces connecting the portal struts with the end posts, the section of the top chord was that of a T, hardly sufficient for a bridge of this size, and the maintenance of the bridge as to painting also very poor.

Therefore it should occasion no suprise that the structure gave way under a heavy train, consisting of two locomotives coupled together and some heavily loaded cars.

HERMANN LAUB, C. E.

Wheel Mileage on the Intercolonial.

BUFFALO, N. Y., Aug. 3, 1891.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your issue of July 24 contained the following interesting statement from the Intercolonial Railroad of Canada:

"In 1887 we were running 520-lb. wheels almost exclusively. We commenced putting in the heavy wheels the latter part of that year, and as the heavy wheels were put in service the consumption decreased and the mileage increased in a marked degree, as the following table will show:

Year ending	Car mileage.	New wheels put in.	Average number of miles run for each wheel put in.
June 30, 1887	52,478,770	6,925	7,578
June 30, 1888	57,156,535	5,776	9,895
June 30, 1889	54,977,796	4,728	11,628
June 30, 1890	59,664,145	4,360	13,684

The increase of weight of wheels would simply give greater safety, and could not possibly increase mileage except on account of the absence of wheel breakage. The number of breakages could not have been sufficient to cause an increase of nearly 100 per cent. in mileage obtained from the wheels used in the year 1890 against the year 1887. That it was possible to double the life of wheels inside of four years must naturally have been due to some other cause, and I think a better one can be given. The Montreal Car Wheel Co. and the St. Thomas Car Wheel Co. furnished the wheels used by the Intercolonial Railroad in the years 1888, 1889 and 1890 almost exclusively. They were all "machined" wheels—that is, the wheels were bored, ground and balanced before being put in service; and this fact seems to offer a better explanation for the extraordinary nature of the result.

All Canadian railroads adopted "machined" wheels as soon as we were able to furnish them, and the result has certainly been to double the life of the wheels on this account. That the Intercolonial Railroad was able to reduce their wheel requirements from 6,925 in 1887 with a car mileage of 52,478,770 miles to 4,360 in 1890 with a mileage of 59,664,145 miles; in other words, to increase the car mileage 10 per cent., and at the same time increase the wheel mileage obtained, 100 per cent. nearly, is a fact on which comment is unnecessary.

The Intercolonial Railroad has been very well paid for the slight additional expense of using "machined" wheels.

P. H. GRIFFIN.

The Baldwin Compound Consolidation for Australia.

In the *Railroad Gazette* of May 29 last we gave an account of the performance of a compound consolidation locomotive, built by the Baldwin Locomotive Works at Philadelphia for the government of New South Wales. We now give some further description and drawings of this engine and details of the cylinders. The erecting card will serve two purposes, one to illustrate the engine and the other to show the manner in which the Baldwin people prepare drawings for their erecting shops. One can well imagine that in work of this kind, where from four to six engines are completed daily, there must necessarily be a large number of drawings and a large force of draughtsmen. As shown by the data printed in the *Railroad Gazette* of June 5, there are on the average only 2.9 engines of the same class in a single order.

The general type of this engine is a consolidation with four cylinders of the Vauclain style. Several specialties are noticeable which are incident to Australian service. For instance, the oil boxes are all provided with pipes leading to brackets on the boiler, so that they may be oiled from the running board while the engine is in motion. There is a brake shaft for the locomotive on the fireman's side of the cab and a screw reverse gear is used. Other peculiarities are shown in the extract from the specifications which appears below.

As will be seen from this drawing, it is necessary in the Vauclain compound to reverse the position of the eccentrics. This appears at detail *A* on the erecting card, where the eccentrics are shown with an advance away from the crank instead of toward it, as in the common locomotive with an intermediate rock shaft between the eccentrics and the valve rod. The air brake reservoirs are located at *B*, one on each side underneath the cab. In engines of this size with low wheels it is necessary to place the low-pressure cylinder above the high-pressure.

We give the erecting card with considerable complete-

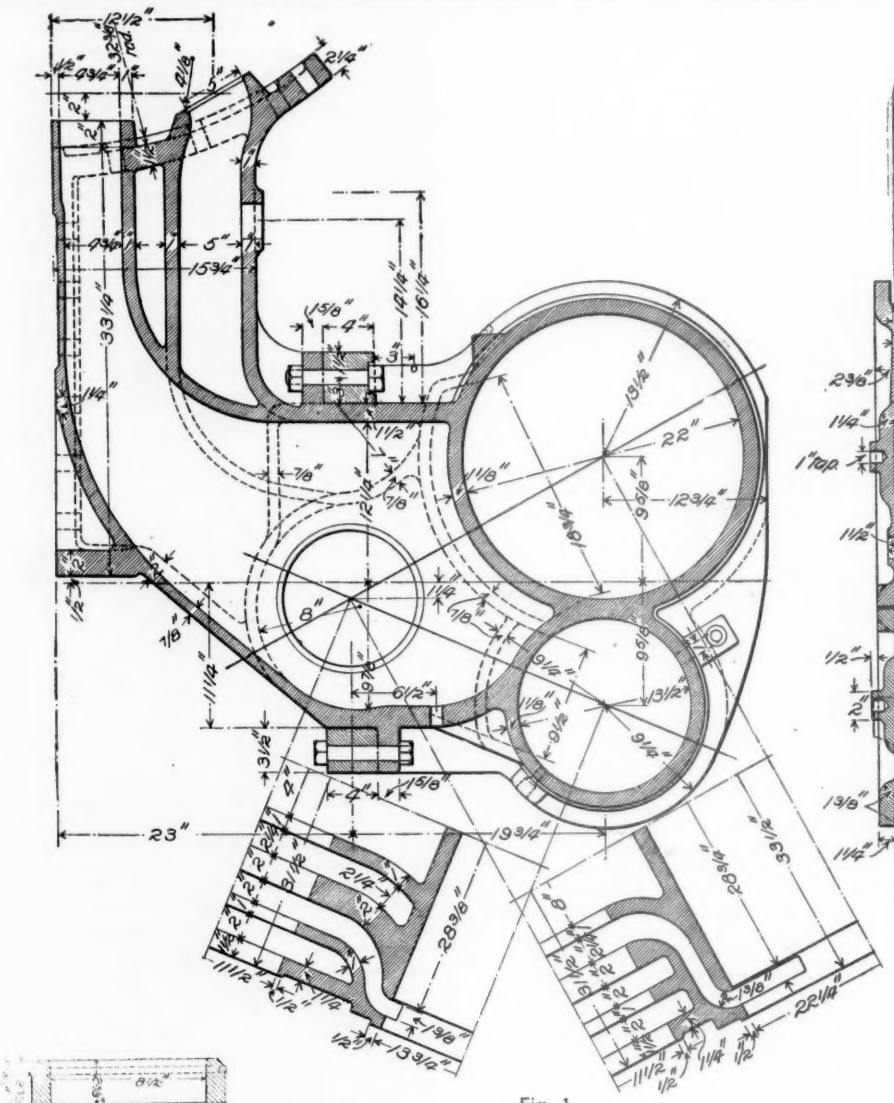


Fig. 1.

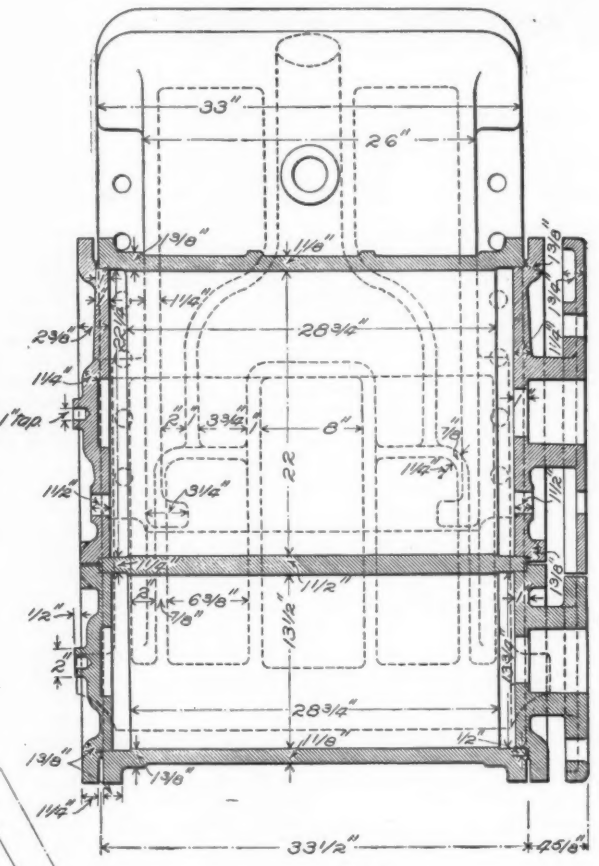


Fig. 2.

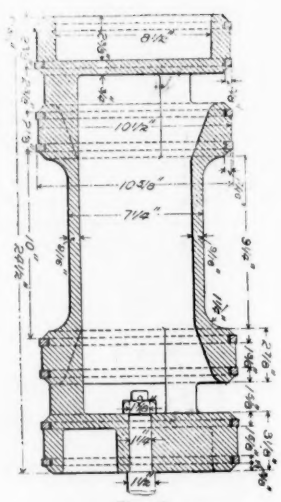


Fig. 3.

Detail of Valve and Bushing.

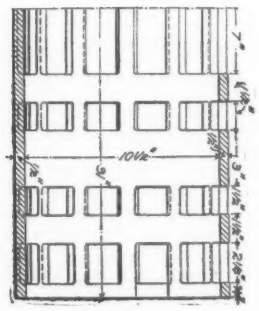


Fig. 4.

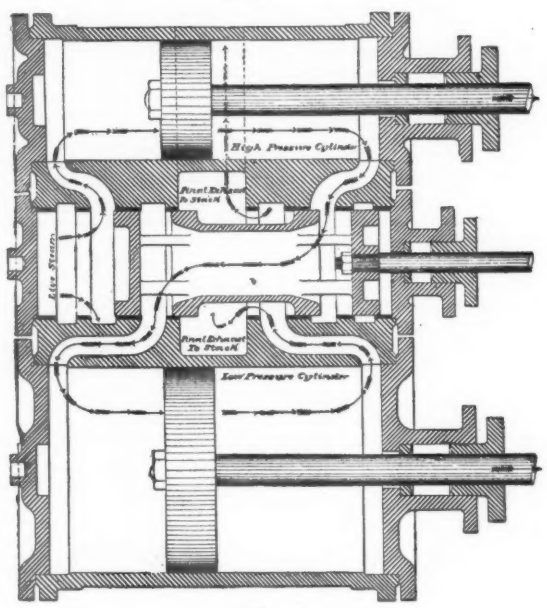


Fig. 5.

Diagram Showing Action of Steam.

CYLINDERS OF BALDWIN COMPOUND LOCOMOTIVE FOR THE GOVERNMENT OF NEW SOUTH WALES.

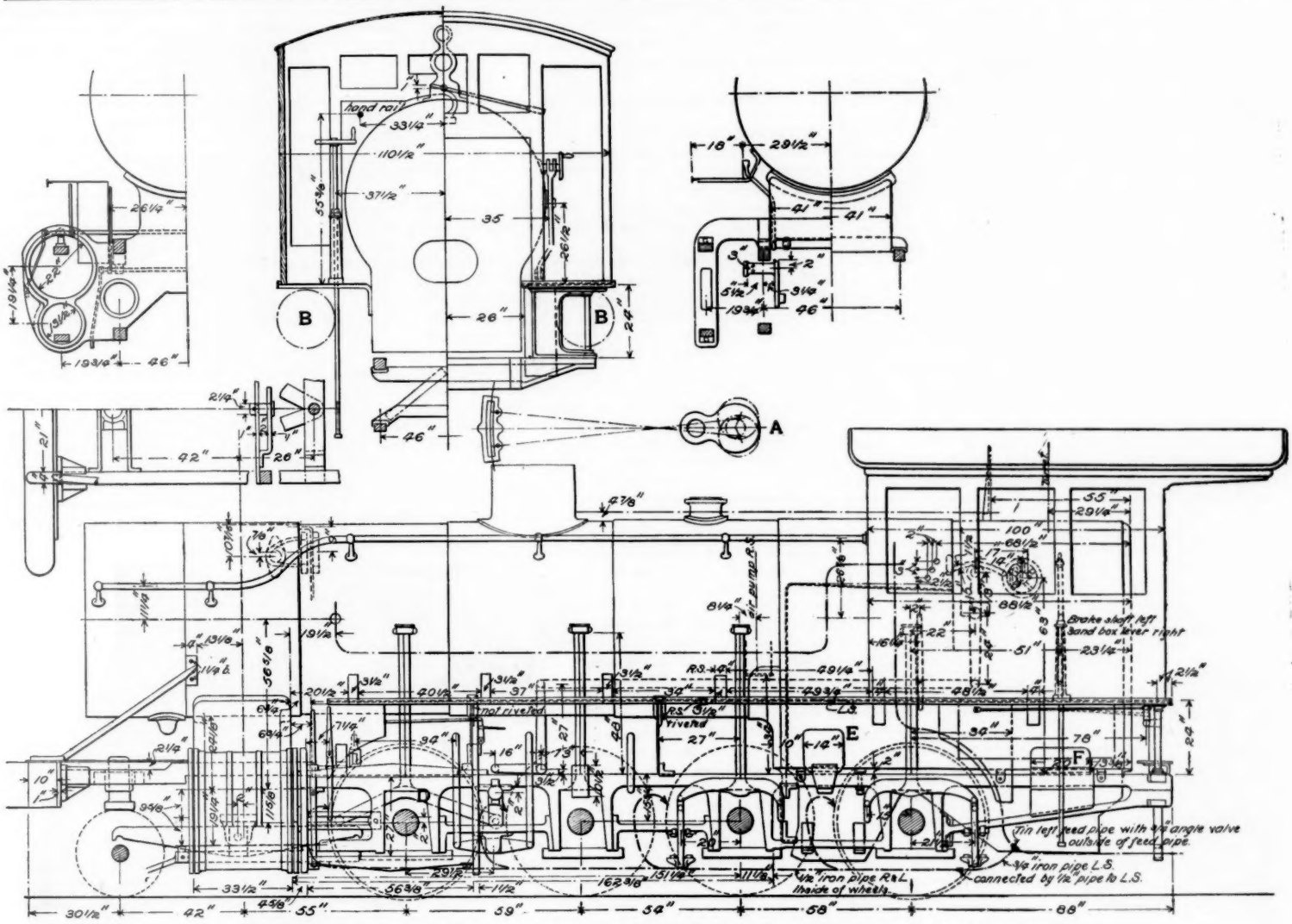
ness, as it will indicate what dimensions are needed on such drawings to furnish the information necessary to erect an engine, in addition to that which may be found in the shop specifications. The valve rod for this type of engine has to pass over the front driving axle and is shown at *D*. It has to be bent at a considerable angle. All but the lower frame braces are bolted in. Contrary to the usual custom of the Baldwin Works the boiler is mounted on the frames by expansion pads instead of expansion links. These pads are shown at *E* and *F*.

The cylinders as shown in figs. 1 and 2 are bolted to the frames by horizontal and vertical bolts, the cylinder saddle and steam chest being cast in one piece. The valve is a piston valve, also peculiar to the Vauclain type of compound. The detail of the valve and its bushing is given in figs. 3 and 4. It will be remembered by those who have read our previous description of this type of compound (see *Railroad Gazette* May 2, 1890) that the valve seats are formed by a cast-iron bushing about ⅛ in. thick, which is put into the hole bored out in the cylinders. This bushing has ports in it, which are properly located to work with the valve, fig. 3. There are eight of these rings in the valve as shown in fig. 3, the joint in the rings being at the bottom of the piston valves. Special machinery is being constructed by the Baldwin Works to bore this type of cylinders with great rapidity. There are three cylinders to bore for

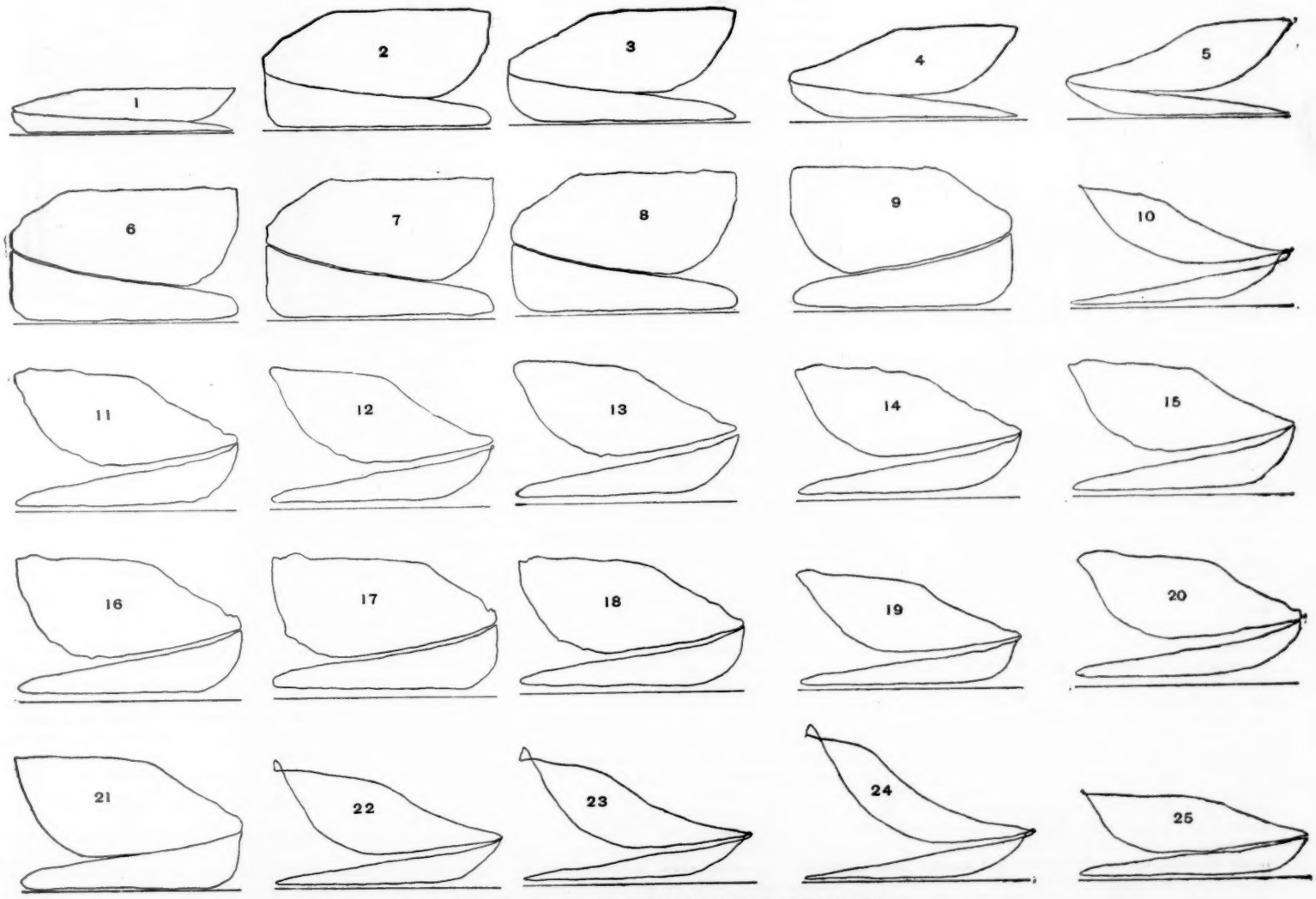
TESTS OF VAUCLAIN COMPOUND LOCOMOTIVE ON PENNSYLVANIA AND LEHIGH VALLEY RAILROADS.

Date.	No. of trip.	Railroad.	No. of cars.	Weight of train.	Time consumed.	Time detained.	Running Time.	Coal burned.	Water evaporated.	Coal per car mile.	Water per lb. coal.	Coal allowed by R. R. Co. per car mile.	Locality.
1891.				Tons. Cwt.	Hour. Min.	Hour. Min.	Hour. Min.	Tons. Cwt.	Tons. Cwt.				
May 13	1	L. V.	29	257 10	1 20	0 20	1 0	0 17	6 16	5.4	8.00	.....	Sugar Notch & Fairview.
" 13	2	"	32	284 2	1 31	0 11	1 20	0 18	7 6	5.7	8.11	.....	Sugar Notch & Fairview.
" 14	3	"	32	295 14	1 11	.....	1 11	0 19	6 18½	5.5	7.28	.....	Sugar Notch & Fairview.
" 15	5	"	32	295 14	0 50	.....	0 50	0 13	6 11	3.7	10.0	.....	Sugar Notch & Fairview.
" 15	6	"	36	319 6 Net tons.	1 4	.....	1 4	0 14½	6 17	3.7	9.4	.....	Sugar Notch & Fairview.
" 17	7	Penn { E 50 C / 90 H }		563-C 1,022-H	8 0	2 33	5 27	Lbs. 11,800	Lbs. 80,925	2.7	6.8	4.6	Phila. to Harrisburg.
" 18	8	"	E 80	880	9 5	1 32	7 37	13,000	125,330	2.5	9.6	4.6	Harrisburg to Altoona.
" 18	9	"	27	338	*	*	*	*	*	*	*	*	Altoona to Gallitzin.
" 18	10	"	40	404	*	*	*	2,950	20,900	12 3	7.0	.....	Altoona to Gallitzin.
" 20	12	"	{ 65 M / 69 H }	2,483-M 2,654 H	11 15	3 10	8 05	9,150	....	1.04	....	4	Altoona to Harrisburg.
" 21	14	"	{ 66 C / 30 P }	2,425.40 1,053-P	10 30	2 47	7 23	9,100	68,890	2.2	7.5	4.6	Harrisburg to Phila.

* No record; detained by other trains.



ERECTING CARD FOR COMPOUND LOCOMOTIVE FOR THE GOVERNMENT OF NEW SOUTH WALES.



INDICATOR CARDS—BALDWIN COMPOUND LOCOMOTIVE.

Taken on the Lehigh Valley and Pennsylvania Railroads, May, 1891.

each side instead of one as with the common engine, but there is no planing for the valve seat, as it is finished entirely by the boring mill. The action of this compound, and the passage of the steam in the cylinders, is clearly shown in fig. 5. The arrows show the steam as it would move with the relative position of the valve and seats as shown in the illustration.

The indicator cards taken on the recent test are given herewith, numbers 1 to 25, and the details of speed and revolution are given in the small table. These cards show how great is the expansion with this type of engine when compared to the expansion in a simple engine doing identical work. There is sufficient difference of expansion to give this type an unquestionable superiority over the simple engine, leaving out the question of cylinder condensation and all other gains which are incidental to compounding, but which are uncertain in amount. There is in the increase of expansion for the same pressure a sufficient gain to make this type of compound show at least 20 per cent. economy when compared with other engines of equal weight and steam pressure working under similar conditions but built on the proportions which are commonly followed for simple engines. So far as all the tests that have been made to date with this engine are concerned, there is every evidence that in heavy work the saving which it will make may be safely taken as averaging 20 per cent. Engines of this pattern are being built for heavy freight work in this country, and one road is to make a competitive test of this type with a simple engine identical in every way except in not being compound.

The accompanying table gives the corrected calculations for the recent tests of this engine on the Lehigh Valley and Pennsylvania roads.

EXTRACTS FROM SPECIFICATIONS.

The engine is a consolidation type, 4 ft. 8½ in. gauge, with 13½ in. and 22 in. × 26 in. cylinders. It weighs fully loaded 187,100 lbs., of which 123,000 lbs. is on the drivers. The loaded tender weighs 72,000 lbs.; driving wheels are 51 in. in diameter; driving-wheel base, 22 ft. 4 in.; rigid-wheel base, 14 ft 3 in.; fuel, soft coal.

The boiler is 64 in. in diameter, with straight top, and is $\frac{9}{16}$ in. thick, riveted with 1 in. rivets. The total heating surface is 1,967 sq. ft., of which 158 is in the firebox and 1,809 in the tubes. The working steam pressure is 175 lbs. per sq. in. The firebox is of copper, side and back sheets ⅛ in., flue sheets ⅞ in. and ½ in., crown sheet ½ in. The grate is 112 in. long by 42½ in. wide. The crown is supported by iron radial stays 1 in. in diameter. Flues are of brass Nos. 12 and 14 wire gauge, 231 in number. All steam pipes made of copper ¼ in. thick. The reversing gear is of the screw type. Injectors are Sellers' 1887 pattern.

Truck wheels are 30 in. in diameter, with cast-iron centre and steel tires. Truck axle journals are 5 in. in diameter and 10 in. long.

This engine is provided with American equalized driver brake, operated by air, and screw hand brakes, and with the Westinghouse automatic air brake on all driving and tender wheels. There is also a Le Chatelier valve for admitting water and steam to cylinders for braking purposes on long grades. Brakeshoes are of the Ross type. Both engine and tender have spring buffers and drawhook.

DETAILS OF INDICATOR CARDS.

No. of Card.	1891.	Revolution per minute.	Speed, miles per hour.	Where taken.
1	May 10.	Starting.	Starting.	Phila. & Reading.
2	"	60	9.11	
3	"	60	9.11	
4	"	84	12.74	
5	"	72	10.92	
6	May 14.	54	8.19	Lehigh Valley, 96 ft. grade at Wilkesbarre.
7	"	60	9.11	
8	"	66	10.01	
9	"	90	13.65	
10	"	150	22.75	
11	May 17.	126	19.11	Pennsylvania Railroad. Philadelphia to Harrisburg.
12	"	132	20.02	
13	"	156	23.66	
14	"	162	24.57	
15	"	162	24 57	
16	May 18.	102	15.47	Pennsylvania Railroad Harrisburg to Altoona.
17	"	108	16.38	
18	"	132	20.02	
19	"	138	20.95	
20	"	180	27.30	
21	May 20.	....	.....	Pennsylvania Railroad. Altoona to Harrisburg.
22	"	....	.....	
23	"	250	37.85	
24	"	....	.....	
25	"	....	.....	

A Double-Coil Baker Car Heater.

We give herewith an illustration of the latest design and construction of car heater by the Baker Heater Co., of New York City. The heater occupies the same amount of floor space and volume as before, but is provided with more than double the amount of heating capacity and an enlarged grate area. The object of enlarging the capacity of these heaters is to meet the demands of colder localities and increased size of car bodies.

The fire grate is enlarged by forming openings in an inclined rim about the grate. The heating surface is increased by the use of two coils instead of one, and by providing for an independent circulation in each coil. The outside coil is 46 ft. 3 in. long, and gradually increases from 1¼-in. diameter at the bottom connection to 2-in. diameter at the top, where it passes up to the circulating drum. The inner coil is 16 ft. long, with same diameters at each end. The two coils together have a capacity equal to 75 ft. of 1¼-in. pipe, and about 30 sq. ft. of heating surface. The water is fed to the heater after the usual manner, each circuit being supplied independent of the other. As seen in the illustration, the circulating and supply drum is divided by a perforated partition at its centre, whereby an equalization of pressure and water level is effected. The two coils of the new construction are applicable to the old heater, the additional coil taking the place of the cast-iron lining, which may be removed, thus utilizing through the outer coil all the heat formerly taken up and radiated by the old lining. The grate of the old-style heater, however, cannot be changed.

Train Accidents in Great Britain.

The English Board of Trade return for the first quarter of this year has been issued. Fifteen train accidents were investigated by the inspectors; but to avoid too much sameness in our narrative we have selected for condensation here only those reports which seem from the index to be specially instructive or to embody novel features.

Some of the most unusual experiences that have been felt by English railroad men for a number of years occurred at the time of the "blizzard" which visited that country on March 9, and there is a report of a collision which happened at that time on the Great Western, near Ivybridge. A passenger train was derailed in a snowdrift on the evening of the 9th, and the engine and most of the cars stood there until the 12th before a wrecking train could reach them. The passengers had to remain in the cars throughout the first night. The storm continued on the 10th, but on the 11th repeated attempts were made to reach the stalled train with two engines at a time. Finally on the 12th a train was sent to Plymouth to get some jacks for use in rerailing these cars, but by the time it reached Plymouth another engine had started with the jacks. The engineer of this train had written instructions to go only to Hemerdon, and the block telegraph wires being down he carelessly went on from that station toward the derailed train without knowing the exact position of the latter, and ran into it, causing the death of one employé. The locomotive foreman for the division was on the engine going to assist in rerailing the passenger train, but Colonel Rich throws no part of the responsibility upon him. He had never been an engine driver and was a "fitter" by trade.

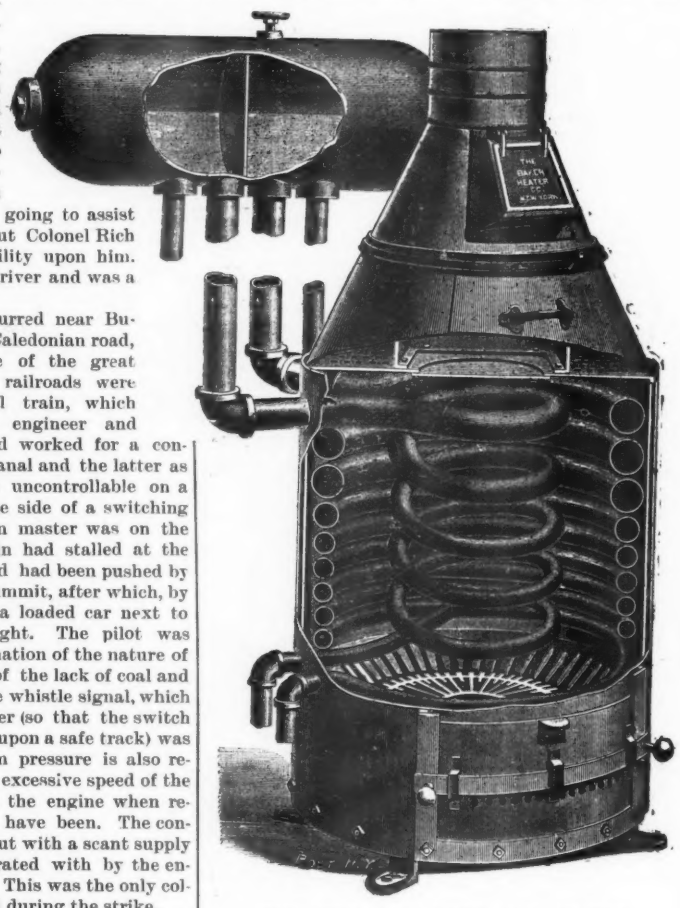
On Jan. 7 a fatal collision occurred near Buchanan street, Glasgow, on the Caledonian road, which was a direct consequence of the great strike under which the Scotch railroads were laboring at that time. A coal train, which was run by an inexperienced engineer and fireman, the former of whom had worked for a contractor on the Manchester Ship Canal and the latter as fireman on steamships, became uncontrollable on a descending grade and struck the side of a switching freight at the station. A station master was on the engine acting as pilot. The train had stalled at the foot of a grade for lack of coal, and had been pushed by a following passenger train to a summit, after which, by the aid of coal borrowed from a loaded car next to the engine, the train ran all right. The pilot was killed, so there is no clear explanation of the nature of his blunder; but in consequence of the lack of coal and the consequent want of steam, the whistle signal, which was given on approaching a tower (so that the switch might be thrown to let the train upon a safe track) was inaudible; and insufficient steam pressure is also regarded as one of the causes of the excessive speed of the train, as the retarding power of the engine when reversed was not what it should have been. The conductor had insisted on starting out with a scant supply of coal, though he was remonstrated with by the engineer and guard of the train. This was the only collision of consequence on that road during the strike.

On the same road, Feb. 19, the runner of an empty engine, who was in a hurry to get over the road, ran up behind a passenger train and pushed it up a grade out of Glasgow, without coupling on and without authority. On arriving at the top of the grade he stopped and then followed the passenger train slowly; but there was a dense fog and the passenger train was unexpectedly stopped and he ran into it, injuring four passengers. The foreman shunter, or yardmaster, knew what this runner was doing and is blamed for not remonstrating. The runner, Robb, did not even tell the conductor or engineer of the passenger train what he was going to do, and, moreover, if he had had leave to push the train he broke a plain rule requiring the engine in such cases to be coupled to the train. This rule also requires that a helping engine shall never leave a train except at a signal station. Considering the state of the weather, the guard of the passenger train, who knew that the pilot engine was following, ought, says Major Marindin, "to have got out to try to protect his train the moment that it was stopped unexpectedly, even at the risk of being left behind if the signal for his train was lowered." The inspector says that engines should never be used on the rear of passenger trains simply to get them through one or two block sections.

At Stoneham, on the Caledonian, March 25, an engine which had helped pull a passenger train was detached and run around to push the same train up a grade. The train stood on the crossover, so that the helping engine could not get onto the main track and start until some time after the passenger train had started, and then it had to be coupled on while both were in motion. Major Marindin says that this risky and somewhat difficult operation of catching up a running passenger train has been frequently condemned by the Board of Trade, and he hopes that pushing engines at the rear of passenger trains will be abandoned; or at least, if they are continued, that the company will enforce its own rules, which require such engines to be coupled to the train with a slip coupling.

On the Lancashire & Yorkshire, at Manchester, Feb. 24, a passenger train ran into two engines in consequence of the carelessness of the runner in going by a signal without noticing whether it was or was not at danger; but the collision would probably not have occurred had the fog signalmen been at their posts, and General Hutchinson regards this as "a strong argument in favor of some mechanical system of fog signal which would at any rate be available in case of an emergency when it is impossible to assemble the fogmen in time [as was the case here] even if it cannot entirely supersede the necessity of employing fog signalmen."

Near Euxton, on the London & Northwestern, Jan. 7, a freight engine became separated from its train and the cars afterward ran into it, making a bad wreck, which fouled the adjoining main line and damaged an express train which came along then, though none of its vehicles were derailed. The train broke in two in consequence of a defective link in a wagon belonging to the Furness Railway Company, and Colonel Rich says that long and heavy freight trains should be made more secure by double couplings. The freight engineer is held to have been heedless in not sooner noticing that his train had broken apart.

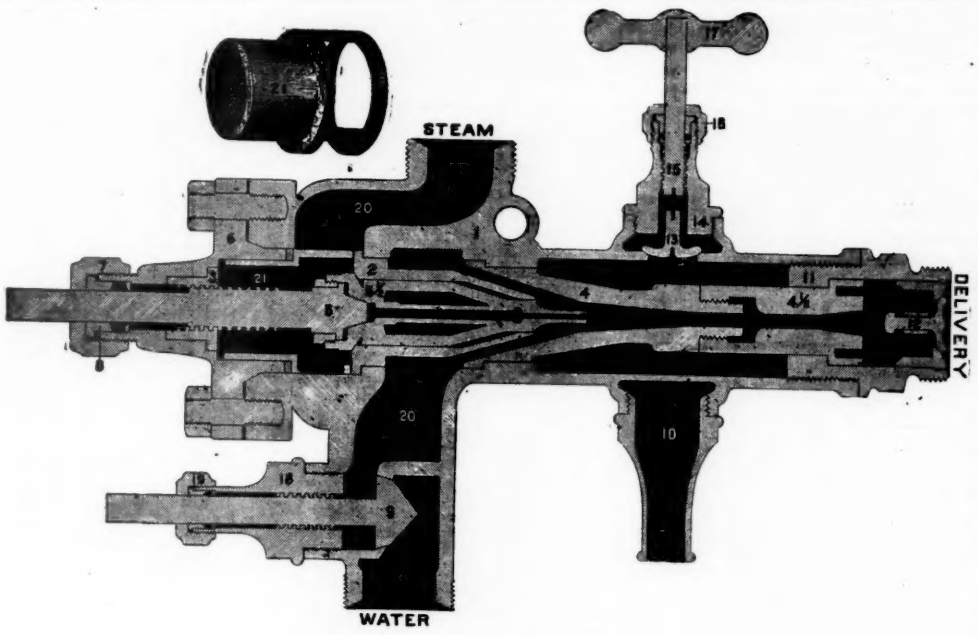


THE TWO-COIL BAKER CAR HEATER.

At Upper Holloway, on the Tottenham & Hampstead line, Jan. 2, an accommodation passenger train, setting off in a freight yard to make way for a fast passenger train, struck the engine of a freight train which was standing on an adjoining siding. The signalman is responsible for seeing that the track is clear before he allows a train to back in, although some of the switches leading from one siding to another are not under his control; this man alone is blamed, though Major Marindin criticises the practice of backing a passenger train upon tracks where the switches are not connected with the tower. The "train receiver," a man who worked in the yard, had agreed to notify the tower man in case certain tracks were *not* clear, and he failed to do so in this case; but the inspector will not admit this fact in mitigation of the fault of the signalman. This passenger train had had to back off on the two preceding evenings, and at other times; and the inspector thinks the time table had better be changed.

Mack's Improved Injector.

A new injector patented by Mr. W. B. Mack and manufactured by the National Tube Works, of Boston, Mass., is illustrated here. The object of the improvement is to facilitate taking apart the apparatus for cleaning. The cones can be removed intact, the steam cone from the spindle end and the delivery cone from the delivery end. The removal of the cap 6 releases the steam cone and its



MACK'S IMPROVED INJECTOR,

Made by the NATIONAL TUBE WORKS CO., *Boston, Mass.*

spindle, when the surrounding cone 2 can be removed. The unscrewing of the delivery nut 11 carries with it the delivery cone tube 4, thus emtying the injector body of all its parts and permitting of a thorough examination and cleansing of every detail.

The Moenchenstein Bridge Disaster.

German and Swiss papers, as was to be expected, continue to devote a good deal of attention to the disastrous bridge accident at Mönchenstein, in Switzerland, of which a pretty full account has already been published in the *Railroad Gazette* of July 17.

A correspondent of the *Wochenschrift des Oesterreichischen Ingenieur und Architekten Vereins*, among others, writes to that journal that calculations, based upon published drawings of the bridge, show its weight in its original condition to have been 478 metric hundredweights. After it had been re-enforced in the manner explained and illustrated in the issue already referred to, the total weight of the structural materials employed was 510 hundredweights. According to the Swiss Board of Trade regulations of 1887, however, a bridge of the length of the Mönchenstein structure, intended for loads of the extent current on the line of which it formed a part, calls for materials weighing not less than about 800 or 850 cwts., greater by about 60 per cent. than the actual weight used. Coupling this circumstance with the alleged poor state of repair in which the bridge was, it is maintained that it is not at all necessary to look to derailment of the train as the probable cause of the accident.

Another correspondent of the *Wochenschrift* points out that not only were the web plates of the cross-girders altogether too weak, to begin with, but that they, moreover, had portions cut away to make room for the longitudinal track girders, each of which extended continuously over two of the bridge panels.

Still another correspondent, Prof. J. E. Brik, holds that the indifferent manner in which the bridge was repaired after the floods of 1881, defective design of the cross-girders and of the longitudinal secondary girders, and their careless connection, and, finally, the poor character of the painting of the bridge, are almost alone sufficient to account for the accident. Derailment of the train, he thinks, deserves little consideration as a probable cause. Referring to the web plates of the cross-girders, he considers it a matter of much surprise that, while measuring 850 mm. (about 34 in.) in depth, they were only 7 mm. (0.28 in.) thick.

He also criticises the disposition of the vertical ties which transmitted the weight on the cross-girders to the upper chords, and undertakes to show, by calculation, that, taking the least area of cross-section of these ties, they were strained up to the limit of elasticity by the static effect alone of the weight. To this he attaches much importance, as, under the circumstances, little vibration would be needed to cause rupture of the ties. With these once broken, the full effect of the vertical bending strains would come on the lower chords, which he considers to have been manifestly inadequate for the work. He concludes, therefore, that the accident was largely, if not wholly, due to the weakness of the vertical ties.

As opposed to this view Dr. A. Föppl, a civil engineer of Leipsic, Germany, contributes to the *Schweizerische Bauzeitung* of July 18 an article in which he discusses bridges of the Mönchenstein type at some length, and endeavors to prove that the whole explanation of the accident is to be looked for in the insufficient lateral bracing of the upper chords.

The *Bauzeitung*, in one of its latest articles on the accident, gives the total number of people killed as 73. Up to June 30 131 claims for damage had been entered against the railroad company, bringing the total number of persons affected by the accident up to over 200. Twelve persons were classed among the missing as late as July 3.

It is pointed out also that the accident has had the effect of prominently bringing out the importance of conscientious bridge inspection in the various countries of Europe. While bridge inspection regulations have no doubt been in force in most, if not all, of them, the Mönchenstein disaster has aroused increased activity on the part of railroad and government authorities. The advisability of permitting the use of two locomotives for one train has also been brought up for discussion.

On the Austrian railroads periodical, thorough examinations and tests of bridges are prescribed and must be made at least once every six years. On the government railroads there are prescribed, moreover, two examinations every year of bridge substructures. On the Southern railroad of Austria a thorough overhauling and strengthening of bridges was commenced in 1888. One hundred and forty-four iron bridges were completely replaced by new ones, and 296 were re-enforced in different parts; 254 other bridges are at present undergoing examination. On the government lines 1,126 of the existing 4,808 bridges have been strengthened.

Ammonite, a New Explosive.

Additional experiments and observations upon ammonite seem to confirm the first opinions regarding its safety and its power. Direct application of heat or concussion fail to explode it. Atmospheric changes exert no influence upon it whatever. It has been tried in a large number of the most dangerous coal mines in England without igniting the gases which were known to be present at the time. A mixture of coal gas and coal dust was not exploded by it, even when no more than two inches of tamping was used.

The safety tests have been so thorough and satisfactory that the railroads of the United Kingdom accept ammonite as freight without the usual restrictions placed upon explosives, and it even meets the requirements of Sir George Elliot for perfect security, which is saying a great deal.

Ammonite consists of an intimate mixture of 81½ per cent. of ammonium nitrate and 18½ per cent. of mononitro-naphthalene. The manufacture is extremely simple and practically unattended with danger. Being free from chlorates it is not liable to decomposition or spontaneous combustion. Having no picric acid or chlorinated derivatives of hydro-carbons in its constitution it yields no injurious or corrosive fumes among its products of combustion. It is put up for use in lead-foil cartridges and exploded with a detonator.

Tests made in England on July 9 showed that it possesses great strength, a projectile of 29 lbs. weight being thrown from a mortar elevated 45 degrees, to a distance of 320 ft. from the muzzle by a 5-gramme charge, as against 289 ft. by a similar charge of No. 1 dynamite, and 136 ft. by an equal weight of gunpowder. Notwithstanding this, ammonite has as yet only been proved of value in comparatively soft material. Experiments are in progress, however, to secure if possible a high efficiency with this explosive in hard rock work. While the security claimed for ammonite is highly encouraging it should be remembered that it is commonly "the unexpected that happens." It would seem that ammonite possessed a special virtue in the absolute safety of its separate ingredients, and in the great ease of its manufacture, which would enable it to be made upon the spot where it was needed, by any one having even a meager knowledge of chemistry, and with a very inexpensive plant.

The Railroads of the United States in 1890.

Poor's Manual for 1891 will soon be published, and we are able to make the following extracts from the introduction. The data are for the fiscal years of the various companies ending in 1890 unless otherwise stated. The figures of mileage of lines are as follows:

	Miles.
Length of track Dec. 31, 1890	166,817.41
Completed to close of fiscal years	163,420.34
Completed since close of fiscal years	3,397.07
Net increase of mileage in the calendar year 1890	5,498.38
Net increase of mileage in the fiscal year 1890	3,426.56

In the years 1880 to 1884, inclusive, the mileage increased 40,759 miles, or more than 48 per cent., while the capital investment increased $2,804,381,537, or 57.5 per cent., this increase consisting of an increase of 57.1 per cent. in capital stock, 58.2 per cent. in funded debt, and 56 per cent. in other forms of indebtedness.

In the five years ending with 1889 railroad mileage increased 36,244 miles, or 29.8 per cent. Capital investment increased $2,004,543,195, or 26.1 per cent. This increase in investment consisted of an increase of 19.5 per cent. in capital stock, 31.6 per cent. in funded debt and 46.1 per cent. in other forms of indebtedness. In 1890 the mileage increased 3,426 miles, or 2.1 per cent.; the capital investment increased $441,693,651, this increase consisting of $145,140,260 in capital stock, $277,536,254 in funded debt and $19,017,137 in other forms of indebtedness. As compared with the average per year for the five-year period ending with 1884, the total capitalization of 1890 shows a decrease of $119,182,656, against an increase of $40,785,012 as compared with the yearly average for the subsequent five-year period ending with 1889.

In the following statement are given the mileage, gross and net earnings of all the railroads in the United States (*including elevated railroads* in New York and Brooklyn) for the seven years 1884 to 1890, inclusive, and deductions therefrom:

	Road worked.	Gross earnings.	Net earnings.	Gross earnings per mile.	Net earnings per mile.	Increase or Decrease over Preceding Year. Road worked.	Gross earnings.	Net earnings.	Gross earnings per mile.	Net earnings per mile.
	Miles.	$	$	$	$	Miles.	$	$	$	$
1884	115,704	777,396,817	270,890,955	6,663	2,318	5,290	*4,376,607	*27,476,330	*798	*384
1885	123,320	772,568,883	269,493,931	6,265	2,185	7,648	1,883,975	1,429,435	*398	*133
1886	125,185	829,940,836	300,603,564	6,570	2,376	1,865	57,371,953	31,109,633	305	191
1887	137,028	940,150,702	334,980,119	6,861	2,441	11,843	100,209,866	34,385,555	291	68
1888	145,387	960,256,270	301,631,051	6,540	2,045	8,359	20,105,568	*33,358,068	*321	*399
1889	153,725	1,002,926,059	322,122,721	6,524	2,095	8,338	42,669,789	20,491,670	*16	50
1890	158,037	1,097,847,428	346,921,318	6,946	2,195	4,312	94,921,369	24,798,397	422	100

*Decrease.

Compared with 1889, gross earnings increased $94,921,369, to which increase the elevated railroads contributed $927,481, the remainder, $93,993,888, being the increase upon the surface roads, made up by increases of $14,225,208 in passenger earnings, $74,412,513 in freight earnings and $5,356,167 in mail, express and other miscellaneous earnings.

The *cost per mile* of all roads making return, as measured by the amount of their stocks and bonded indebtedness, equaled $59,638, against $58,274 for 1889.

In 1880 the *total capital* investment of the railroads of the United States, measured by the amounts of their share capital, funded and unfunded debts, was $5,108,241,906. Their gross earnings in that year equaled $615,401,931, or 12.4 per cent. on capital invested, while net earnings amounted to $255,193,436, being 4.9 per cent. on capital invested.

In 1885 the total capital investment was $7,852,533,179; gross earnings equaled $772,568,833, or 9.9 per cent. on capital invested; net earnings, $269,493,931, being 3.4 per cent. on capital invested. In 1886 the total investment was $8,163,148,652; gross earnings were $829,940,836, equal to 10.2 per cent. of investment, and net earnings $300,603,564, or 3.7 per cent. on capital. In 1887 the total investment was $8,673,187,216; gross earnings were $940,150,902, equal to 10.8 per cent. of investment, and net earnings $334,989,119, or 3.9 per cent. on capital. In 1888 the total investment was $9,369,398,954; gross earnings were $960,256,270, equal to 10.2 per cent. of investment, and net earnings $301,631,051, or 3.2 per cent. on capital. In 1889 the total investment was $9,680,942,249; gross earnings were $1,002,926,059, equal to 10.3 per cent. on investment, and net earnings $322,122,721, or 3.3 per cent. on capital.

In 1890 the total investment was $10,122,635,900; gross earnings were $1,097,847,428, equal to 10.8 per cent. on investment, and net earnings $346,921,318, or 3.4 per cent. on capital.

From these statements it will be seen that in 1890 the percentages of returns on investment were slightly increased over the percentages of the two preceding years, although not up to the averages of the earlier years of the decade.

A year ago, in presenting the returns for 1889, the

Manual, in commenting upon the showing then made, ventured this opinion: "From the current reports of earnings made by the leading companies it may conservatively be estimated that the earnings of the railroad systems during the fall calendar year 1889, average at least $6,700 per mile, a rate which would equal $1,070,000,000 per annum for the 160,000 miles now in operation."

The year covered by the statements now presented is, as formerly, not uniform. Of all the roads whose operations are given probably one-half would cover the year ending June 30, 1890, the remaining half covering years ending at various dates between July 1 and Dec. 31. It is particularly gratifying, therefore, to record the fact that the average rate of gross earnings per mile is considerably greater than the estimate made for the full calendar year of 1889, equaling $422 per mile more than the previous fiscal year and $246 per mile more than the estimate for the calendar year 1889.

Comparative statement showing the averages per mile of stock, bonds, cost, and earnings, percentage of expenses to earnings, earnings per passenger train mile and per freight train mile, per passenger mile, and per tonnage mile, etc., for years 1885 to 1890 inclusive.

	1890.	1889.	1888.	1887.	1886.	1885.
	$	$	$	$	$	$
Capital stock per mile of completed road	28,333	28,095	28,768	28,321	29,935	29,867
Bonded debt per mile of completed road	31,244	30,178	29,972	28,290	29,062	29,453
"Cost of road and equipment," p. M. of Com. Rd.	53,783	53,740	54,008	52,699	54,301	55,069
Passenger earnings per mile of road in operation	1,732	1,688	1,729	1,756	1,698	1,612
Freight earnings per mile of road in operation	4,686	4,333	4,397	4,649	4,397	4,219
Gross earnings per mile of road in operation	6,875	6,455	6,540	6,861	6,570	6,265
Net traffic earnings per mile of road in operation	2,162	2,068	2,045	2,444	2,376	2,185
Percentage of expenses to earnings	68.54	67.95	68.72	64.45	63.84	65.12
Passenger earnings per passenger train mile	$ 0.920	$ 0.932	$ 0.937	$ 1.008	$ 1.006	$ 0.949
Freight earnings per freight train mile	1.533	1.550	1.557	1.615	1.573	1.518
Gross earnings per revenue train mile	1.968	1.874	1.880	1.445	1.443	1.366
Gross expenses per revenue train mile	0.934	0.934	0.948	0.931	0.921	0.892
Net earnings per revenue train mile	0.434	0.440	0.432	0.514	0.522	0.474
Passenger earnings—proportion of gross	p. c. 25.19	p. c. 26.13	p. c. 26.44	p. c. 25.82	p. c. 25.77	p. c. 26.25
Freight earnings—proportion of gross	68.17	67.13	67.24	68.38	66.94	67.90
Other earnings—proportion of gross	6.64	6.71	6.32	5.80	7.29	5.85
Earnings per passenger per mile	Cents. 2.185	Cents. 2.169	Cents. 2.246	Cents. 2.276	Cents. 2.181	Cents 2.198
Earnings per ton per mile	0.935	0.969	0.977	1.034	1.042	1.057
Average distance per passenger	Miles. 24.06	Miles. 24.18	Mi'es. 24.78	Miles. 24.68	Miles. 25.27	Miles 25.99
Average haul per ton	112.91	110.92	110.72	111.51	109.49	112.46
Interest per cent. of bonds	p. c. 4.36	p. c. 4.40	p. c. 4.35	p. c. 4.71	p. c. 4.75	p. c. 4.77
Interest per cent. of bonds and debt	4.18	4.09	4.17	4.55	4.58	4.62
Dividends per cent. of stock	1.80	1.81	1.77	2.18	2.04	2.02
Int'st and div'ds per cent. of stock, bonds and debt	3.03	3.03	3.03	3.40	3.26	3.36

STATISTICS OF ROLLING-STOCK EQUIPMENT.

Statement showing the rolling-stock owned by the railroads in the United States at the close of their respective fiscal years, 1877 to 1890 inclusive:

Year.	Locomotive Engines.	Revenue Cars. Passenger.	Baggage, Mail and Express.	Freight.	Total.
1877	15,911	12,053	3,854	392,175	408,082
1878	16,445	11,683	4,413	423 013	439,109
1879	17,084	12,009	4,519	480,190	496 718
1880	17,949	12,789	4,786	539,255	556,930
1881	20,116	14,548	4.976	648,295	667,819
1882	22,114	15,551	5,566	730,151	751,568
1883	23,623	16,889	5,848	778,663	801,400
1884	24,587	17,303	5,911	798,399	821,613
1885	25,937	17,290	6,044	805,519	828,853
1886	26,415	19,252	6,325	845,914	871,491
1887	27,643	20,457	6,554	950,887	977,898
1888	29,398	21,425	6,827	1,005,116	1,033,368
1889	31,041	22,885	7,053	1,051 169	1,081,107
1890	32,241	21,958	7,253	1,061,970	1,092,241

XVII.

Statement showing the number of miles of railroad constructed and in operation each year in the United States, from 1830 to the close of 1890, inclusive:

Year.	Miles in Operation.	Annual Increase of Mileage.	Year.	Miles in Operation.	Annual Increase of Mileage.	Year.	Miles in Operation.	Annual Increase of Mileage.
1830	23	..	1851	10,982	1,961	1872	66,171	5,878
1831	95	72	1852	12,908	1,926	1873	70,268	4,097
1832	229	134	1853	15,360	2,452	1874	72,385	2,117
1833	380	151	1854	16.720	1,360	1875	74,096	1,711
1834	633	253	1855	18,374	1,654	1876	76,808	2,712
1835	1,098	465	1856	22.016	3,642	1877	79 088	2 280
1836	1,273	175	1857	24,503	2 487	1878	81,767	2,679
1837	1,497	224	1858	26 968	2.465	1879	86,584	4,817
1838	1.913	416	1859	28,789	1,821	1889	93,296	6,712
1839	2.302	389	1860	30,626	1,837	1881	103,143	9,847
1840	2,818	516	1861	31.286	660	1882	114,712	11,569
1841	3,535	717	1862	32,120	834	1883	121.455	6,743
1842	4,026	491	1863	33 170	1,050	1884	125,379	3 924
1843	4,185	159	1864	33,908	738	1885	128 361	2 982
1844	4,377	192	1865	35,085	1.177	1886	136.379	8,018
1845	4,633	256	1866	36.801	1.716	1887	149.257	12.878
1846	4,930	297	1867	39,250	2.249	1888	156 173	6,916
1847	5,598	668	1868	42 229	2,979	1889	161.319	5,146
1848	5 996	398	1869	46,844	4.615	1890	166,817	5,498
1849	7,365	1,369	1870	52,922	6,078			
1850	9,021	1.656	1871	60,293	7.379			

NOTE.—The "annual increase in mileage" usually represents the net increase within the year named. Below will be found a detailed statement of railroad construction for the three years 1888-90, and similar statements for preceding years will be found in past numbers of the 'Manual." The total mileage of all lines in the country at the end of 1889, as shown by the revised statements presented herewith, was 161,319.03 miles; construction during the year, as per construction table following, 5,738 80 miles; total, 167,057.83, from which deduct 163.34 miles now reported abandoned, and 77.03 miles net miscellaneous decreases, the latter due to the elimination of temporary tracks now transferred to sidings, and the elimination of duplicate tracks, which is largely the result of the more accurate information now called for by the State Boards of Railroad Commissioners.

Statement showing the area, population and railroad mileage in the several states, and their relation one to another, on Dec. 31, 1890.

States and Territories.	Area sq. miles.	Population. Total.	Population. Per sq. mile.	Miles of railroad.	1 mile of R. R. To sq. Miles.	1 mile of R. R. To inhab'nts.
	Miles.	No.	No.	Miles.	Miles.	Miles.
Maine	33,040	661,086	20.00	1,377.47	23.99	479.93
New Hampshire	9,305	376,530	40.46	1,146.89	8.11	328.30
Vermont	9,565	332,422	34.75	988.45	9.58	336.31
Massachusetts	8,315	2,238,943	268.06	2,096.69	3.96	1,067.84
Rhode Island	1,250	345,506	276.40	224.43	5.57	1,539.48
Connecticut	4,990	746,258	149.55	1,006.64	4.96	741.33
New Eng. Group	66,465	4,700,745	70.73	6,840.57	9.72	687.19
New York	49,170	5,997,853	121.98	7,745.85	6.35	774.33
New Jersey	7,815	1,444,933	184.89	2,062.81	3.79	700.47
Pennsylvania	45,215	5,258,014	116.28	8,730.58	5.20	602 3
Delaware	2,050	168,493	82.19	314.95	6.51	534.98
Maryland	12,210	1,042,390	85.37	1,270.04	9.61	820.75
District of Columbia	70	230,392	3,291.31	20.66	3.39	11,151.60
M'dle Atl'tic Gr'p.	116,530	14,142,075	121.36	20,114.89	5.79	703.06
Ohio	41,060	3,672,316	89.43	7,987.99	5.14	459.73
Michigan	58,915	2,093,889	35.54	7,106.15	8.29	294.66
Indiana	36,350	2,192,404	60.31	6,106.19	5.95	359.05
Illinois	56,650	3,826,351	67.54	10,129.65	5.59	377.74
Wisconsin	56,040	1,686,880	30.10	5,614.95	9.98	300.43
Cent. Nt'ern Gr'p.	249,015	13,471,940	54.10	36,944.93	6.74	364.65
Virginia	42,450	1,655,980	39.01	3,367.65	12.58	491.73
West Virginia	24,780	762,794	30.78	1,433.31	17.29	532.19
North Carolina	52,250	1,617,947	40.96	3,128.17	16.70	517.22
South Carolina	30,570	1,151,149	37.66	2,296.65	13.31	50 .13
Georgia	59,475	1,837,353	30.90	4,592.83	12.95	400.05
Florida	54,090	391,422	6.67	2,489.54	23.57	157.23
So. Atl'tic Gr'p.	263,215	7,416,645	27.65	17,308.12	15.50	428.51
Kentucky	40,400	1,858,635	46.01	2,946.78	13.71	630.82
Tennessee	42,050	1,767,518	42.03	2,788.98	15.02	631.49
Alabama	52,250	1,513,017	28.94	3,422.20	15.27	442.12
Mississippi	46,810	1,289,600	27.54	2,470.85	18.94	521.93
Louisiana	48,720	1,118,587	22.96	1,749.95	27.84	639.21
G'f & Miss. V'y Gr'p	230,230	7,547,357	32.78	13,388.36	17.20	563.73
Missouri	69,415	2,679,184	38.60	6,142.02	11.30	436.21
Arkansas	53,850	1,128,179	20.96	2,213.44	24.33	509.59
Indian Country	31,400	.....	.....	1,260.65	55.87	49.05
Oklahoma Territory	39,030	61,834	1.58	.....	.....	.....
Texas	265,780	2,235,523	8.41	8,709.85	30.51	256.67
Kansas	82,080	1,427,096	17.39	8,906.11	9.22	160.35
Colorado	103,925	412,198	3.97	4,291.11	24.22	96.06
New Mexico	122,580	153,593	1.25	1,388.77	88.27	110.60
Southw'tern Gr'p.	768,000	8,097,607	10.54	32,905.95	23.34	246.08
Iowa	56,025	1,911,896	34.13	8,416.14	6.66	227.17
Minnesota	83,365	1,301,826	15.62	5,545.35	15.03	234.67
Nebraska	77,510	1,058,910	13.66	5,407.47	14.33	195.82
North Dakota	70,795	182,719	25.81	2,116.49	33.45	86.33
South Dakota	77,650	328,808	4.23	2,610.41	29.75	125.96
Wyoming	97,890	60,705	0.62	1,002.93	97.60	60.47
Montana	146,080	132,159	0.90	2,195.58	66.53	60.19
N'thwestern Gr'p.	609,315	4,977,023	8.17	27,294.37	22.32	182.35
Washington	69,180	349,390	5.05	1,998.65	34.61	174.81
Idaho	84,800	84,385	1.00	946.1	89.63	89.40
Oregon	96,030	313,767	3.27	1,455.53	65.98	215.57
California	158,36	1,208,130	7.63	4,736.45	36.52	278.60
Nevada	110,700	45,761	0.41	923.18	119.91	49.56
Arizona	113,020	59,620	0.53	1,194.84	103.23	54.46
Utah	84,970	207,905	2.45	1,265.19	67.14	164.29
Pacific Group	717,060	2,268,958	3.16	12,020.22	50.65	188.76
United States	3,024,880	64,622,250	20.70	166,817.41	18.13	375.39

Statement showing the number of miles of steel rails and iron rails; also the percentage of steel rails to the total track in the United States, for the years 1880-90, inclusive:

Year.	Miles Steel Rails	Miles Iron Rails.	Total Miles.	Per Cent Steel of Total
1880	33,680	81 967	115,647	29.1
1881	49,063	81.473	130,536	37.5
1882	66,691	74,269	140,960	47.3
1883	78,491	70.692	149,183	52.7
1884	90,243	66,254	156.497	57.6
1885	98,102	62.495	160.597	61.0
1886	105,724	62,324	168,048	62.9
1887	1 5 450	59,588	185,047	67.7
1888	138,516	52,981	191,497	72.3
1889	151,723	50,513	202.236	75.0
1890	167,606	40,697	208 303	80 4

Statement showing the length in kilometres of all the railroads in the world arranged by the political and geographical divisions thereof:

Countries.	Date of opening first line.	1880.	1889.
Germany	Dec. 7, 1835	33,781	41,793
Luxemburg	Sept. 13, 1859	370	
Great Britain	Sept. 27, 1825	28,860	32.088
France	Oct. 1, 1828	25,932	36.348
Russia	April 1, 1838	23,524	30,140
Austria-Hungary	Sept. 20, 1828	18,704	6,501
Italy	Oct. 3, 1839	8,788	13.063
Spain	Oct. 30, 1848	7,455	9,860
Sweden	Feb. 9, 1851	7,079	7,910
Norway	July 14, 1853		1.562
Belgium	May 5, 1835	4.111	5,174
Switzerland	June 15, 1844	2.635	3,104
Holland and Luxemburg	Sept. 13, 1839	1,792	3,037
Roumania	Oct. 4, 1860	1,394	2,543
Turkey	Oct. 4, 1860	1.394	1.765
Denmark	Sept. 18, 1844	1,579	1,969
Portugal	July 9, 1854	1,248	2,060
Greece	Feb. 18, 1869	13	708
Servia			526
Malta			110
Total Europe	Sept. 27, 1825	168,649	220,261
British Empire	April 18, 1853	14,729	25,488
Ceylon	Oct. 1, 1865	217	289
Java	Aug. 10, 1867	411	1,283
Dutch Possessions			
Asia Minor		394	720
Japan	Oct. 17, 1873	121	1,460
Asiatic Russia			1,433
Malay States			50
China			200
Cochin China			83
Persia			18
Total Asia		15,872	31,024
United States	April 17, 1827	150.607	259,687
Canada (incl. Newf'd'd)	Mar. 19, 1847	11,090	21,624
Mexico	Oct. 8, 1850	1,053	8,600
Costa Rica	Jan. 19, 1872	120	
Nicaragua	Summer of 1880		
Guatemala	June 20, 1880		900
Honduras	Sept. 25, 1871	90	
Salvador	July 15, 1882		
Cuba	Aug. 2, 1839	1,382	1,700
Jamaica	Nov. 21, 1845	40	474
Trinidad	Fall, 1880	25	
Colombia		121	371
Venezuela	Feb. 9, 1896	113	709
British Guiana	Sept. 1, 1861	34	35
Brazil	April 30 1854	3,500	9,300
Argentine Republic	Dec. 14, 1864	2,473	8,255
Uruguay	Jan. 1, 1869	431	757
Paraguay	Oct. 1, 1863	72	240
Chili	January, 1852	1,898	3,100
Peru	May 29, 1851	1,852	1,600
Bolivia	1873	130	171
Ecuador		64	269
Barbadoes	Sept 10, 1883		
Hayti			115
Porto Rico			18
Total America		175,098	317,925
Egypt	Jan. 26, 1856	1,494	1,541
Cape Colony	June 26, 1860	1,157	2,873
Algeria	Aug. 15, 1862	1,405	3,094
Tunis	July 5, 1873		
Natal		150	376
Mauritius	May 13, 1862		
Reunion		14	751
Senegal			
Total Africa		4,635	8,635
New South Wales	May 29, 1855	1,368	3,624
Victoria	Sept. 13, 1854	1,930	3,682
Queensland	July 31, 1865	1,019	3,320
South Australia	April 26, 1856	1,090	2,827
West Australia	Jan. 21, 1864	115	800
Tasmania	Feb. 19, 1871	276	603
New Zealand		2,025	3,066
Total Australia		7,823	17,922
Grand total		372,077	595,767

STATISTICS OF PASSENGER TRAFFIC.

Statement showing the length of road operated, passenger statistics, earnings, etc., etc., of all the railroads in the United States from 1882 to 1890, inclusive.

Years.	Length of R. Rs. in operation.	Miles run by passenger trains.	Passenger Traffic. Passengers carried.	Passenger Traffic. Passenger movement.	Passenger Earnings. Gross amount.	Av. receipts p. pass. p. mile.	Av. receipts p. pass.	Av. receipts p. pass train mile.	Av. receipts per mile of R. R.	Average No. of passengers per mile of railroad.	Average No. of passenger miles per pass. train mile.	Average distance travelled per passenger.
	Miles.	Miles.	No.	Miles.	$	Cents.	Cents.	Cents.	$	No.	Miles.	Miles.
1882	95,752	165,438,158	289,030,783	7,483,059,934	188,137,462	2.51	65.09	113.72	1,964	3,018	45 23	25.89
1883	106,938	187,903,247	312,686,641	8,541,309,674	206,837,256	2.42	66.14	110.07	1,934	2,923	45.45	27.31
1884	113,173	206,516.118	334,570,766	8,778,581,051	206,790,701	2.35	61.87	100.13	1,827	2,956	42.50	26.24
1885	122,110	211,587.620	351,427,688	9,135,673 956	200,883,911	2.20	57.16	94 94	1,645	2 877	43.16	25.99
1886	125,146	210,637,892	382.284,972	9,659.698,294	211,929,857	2.19	55.43	100 61	1,693	3,054	45.85	25.27
1887	136 986	238,755,920	428,225,513	10 570,306,710	240 542,876	2.27	56.17	100.75	1,756	3,126	44.27	24.68
1888	145,341	268,125.345	451,353,655	11,190,613,679	251,356.167	2.24	55.68	93.74	1,729	3,105	41 73	24.79
1889	153 689	279,085,145	494,808,421	11.964,726.015	259,439,231	2.17	52.44	92.96	1,688	3,119	42.87	24.18
1890	157,976	297,244,707	520,439,082	12,521,565,649	273,664,439	2.19	52.58	92.07	1,732	3,294	42.12	24.05

STATISTICS OF FREIGHT TRAFFIC.

Statement showing the length of road operated, freight statistics, earnings, etc., etc., of all the railroads in the United States from 1882 to 1890, inclusive.

Years.	Length of R. Rs. in operation.	Miles Run by freight trains.	Freight Traffic. Freight carried.	Freight Traffic. Freight movement.	Freight Earnings. Gross amount.	Av. receipts per ton p. mile.	Av. rec. per ton.	Av. rec. p. freight train mile.	Av. rec. per mile of R. R.	Average No. of tons per mile of railroad.	Av. No. of tons miles p. freight train mile.	Average haul per ton.
	Miles.	Miles.	Tons.	Miles.	$	Cents.	Cents.	Cents.	$	Tons.	Miles.	Miles.
1882	95,752	305,118,035	360,490,375	39,302,209,249	485,778,241	1.23	134.75	159.21	5,071	3.764	128.81	109 02
1883	106.938	350,108,255	400,453,439	44,064,923,445	539,509,831	1 22	134.72	154.09	5.045	3,744	125.86	110.04
1884	113,172	334,814,529	399,071.749	44,725,207,677	502,869,910	1.12	126.00	150.19	4,443	3,526	133.58	112.07
1885	122,110	342.288,770	437,040,099	49,151,894,469	509 690,932	1.04	116.62	148.91	4,174	3,578	143.59	112.46
1886	125,146	349,697,537	482.245,254	52,802,070,529	550,359,054	1.04	112.05	157. 4	4,397	3,853	150.99	109.49
1887	136,986	394,191,107	552,074.752	61,561 069,936	636,666.223	1 03	115.32	161.51	4.647	4,030	156.16	111.51
1888	145,341	410,514,115	590,857,353	65,423,005 988	649,200,723	0.97	108.18	155.71	4,398	4,065	159.36	110.72
1889	153,689	429,469,737	619,165,630	68,677,276,992	665 962,331	0.97	107.55	155.06	4,333	4,029	159.91	110.90
1890	157,976	482,900,422	701,344,437	79,192,985,125	740,374,844	0 93	105.57	153 31	4,687	4,440	163.99	112.91

The statement of statistics of passenger traffic shows in detail the aggregate returns of passenger traffic of all the railroads in operation in the United States during the fiscal years 1882 to 1890, inclusive--covering the whole period in which these statistics have been furnished complete in the Manual. Similar statements for each separate geographical group into which the United States is divided are also given.

A few of the great facts given in the tables may be put in more convenient shape as below. The following shows the changes in the volume of traffic; the passenger-miles and ton-miles are in *millions*:

	1890.	1889.	1888.	1887.	1886.	1885.	1882.
Miles oper'd..	157,976	152,689	145,341	136 987	125,146	122,110	95,752
Pass. miles.	12.522	11.965	11.191	10,570	9,660	9.131	7.483
Ton-miles....	79,193	68,677	65,423	61.561	52.802	49,152	39,302

The increase in ton-miles was 10,516 million, and in passenger-miles it was 557 million. The increase in ton miles was much greater than in any year since Poor has given these figures. The nearest approach to it was in 1887, when it was 8,760 million. The *increase per cent.* for the years and items given above was:

	1890.	1889.	1888.	1887.	1886
Miles operated.....	2 8	5.7	6 1	9 4	1.5
Passenger-miles.....	4.6	6.9	5.9	9.3	5.7
Ton-miles.....	15.3	4.9	6.3	16.6	7.4

The percentage of increase of the freight movement was nearly as great as in 1887, but the rate of increase of miles operated was but about half as great. It is remarkable that what Mr. Atkinson calls the "heaviest railroad traffic ever conceived of" should have taken place in a year in which the corn crop was very short, the fruit crop almost a failure, the coal movement diminished by a phenomenally warm winter, and business throughout the country generally dull if not depressed.

The rates received and gross and net earnings for several years are reported as below. The earnings are in *millions* of dollars:

	1890.	1889.	1888.	1887.	1886.	1885.
Gross earnings.....	$1,098	$1,003	$960	$940	$830	$773
Net "	347	322	302	$335	$301	$269
Cents per pass. per mile....	2.185	2.169	2.246	2.276	2.181	2.198
Cents per ton per mile	0.935	0.969	0.977	1.034	1.042	1.057

Notwithstanding the fall in freight rates the enormous increase in tonnage caused an increase of 9.4 per cent. in gross earnings and 7.7 per cent. in net; this, with an increase of but 2.8 per cent. in the miles operated.

We may point out, as a matter of some interest, that if the freight of 1890 had been carried at the rates of 1891 the net earnings of 1890 would have been increased by about $27,000,000, or 8 per cent.

The International Electro-Technical Exposition at Frankfort.

The exposition was opened officially on May 16, and is now nearly completed. The grounds have an area of about 20 acres in which there are an artificial hill, a pond, etc. The buildings are mostly occupied by the exhibitors of electrical apparatus, but there are also a theatre where a good farce or music may be heard; a cyclorama of the harbor of New York as seen from the deck of one of the great steamers, the entrance being through the cabin, and so capitally done that one can perceive the ship's smell; also numerous beer gardens and two band stands.

Entrance to the grounds is through the old railroad station, in which are the offices, reading-room, press bureau, etc., of the exposition. The first building contains a collection of medical electrical apparatus, some fine testing instruments, toys, and also in one end Siemens & Halske, of Berlin, and other Siemens manufactories, have a collection of their electrical instruments for all purposes, with dynamos, motors and accumulators to put them in operation. In an adjoining building Siemens & Halske have a small model theatre with complete arrangements for showing the scenic effects possible to obtain with electric lighting.

From here we go around the artificial hill, surmounted by a pretty wine garden, through which flows a stream of water that tumbles over the cliff, making a waterfall of considerable size. Under the cliff is a cavern from which a great dragon is crawling and vomiting hot water and steam; at night the dragon and cavern are beautifully illuminated with changing colored lights.

Under the hill is a "drift" in which Siemens & Halske show their electric mine locomotive and other mining apparatus. The locomotive pulls a passenger car into the "mine" on which everybody rides, to the delight of those who have never been underground. The apparatus is similar in design to that in use in the United States. They use a ground return circuit and copper overhead trolley wire supported in the usual way. The trolley used, however, differs entirely from those in America, but has the same characteristic that makes their street-car trolley worthy of notice. They have a line running from the grounds to the opera house, with two cars working on the trolley system and one or two with accumulators. Instead of a wheel or spoon, as used in the United States, they have a steel rod nearly as long as the car is wide, supported in a somewhat similar manner to our trolley wheel and of something this shape. It has many advantages, the principal ones being that it cheapens the line construction greatly, as no switches need be used to guide the trolley, and with it it is unnecessary that the trolley wire should conform to the curve of the track exactly, as contact can be made at any point on the cross-rod. The pole is attached to the car as ours are, except that it is much shorter; the hinge and springs, instead of being on the car roof, are raised considerably above it; the pole being shorter stands straighter, and when the direction of the car is changed it flops over, raising the trolley wire just a little.

From the "mine" we cross an open space in which is a band stand and enter the main building, at the entrance of which is the electric-light exhibit of Schuchert & Co., of Nüremberg, showing their direct and alternating current machines, lamps, etc. Then we hear the familiar "buzz" of a Thomson-Houston arc machine, and beside it stands one of their street-car generators. It seems strange to see these old friends in the hands of people who do not understand the language in which they were built.

In the centre of the building is the largest dynamo in the exposition, an alternator built by the Helios Electric Light Company, of Cologne, under the patents of Zipernowsky-Déri-Blàthy, who are the experts of Ganz & Co., of Buda-Pesth. This machine has a capacity of 600 H. P., with an E. M. F. of 2,000 volts; an internal revolving field with 40 laminated pole pieces bolted to a cast-iron frame keyed to the shaft, which is directly connected to a compound engine of 600 H. P., one cylinder on each side. The engine makes 125 revolutions, giving 2,500 periods per minute (about one-third the periods usually employed in America), and is excited by a separate direct current machine. The dynamo is about 10 ft. in diameter. The Helios people have adopted an ingenious switching apparatus with levers and interlocking arrangement, by which they are enabled to regulate the current, throw the alternators into multiple-arc, and accomplish all the work usually done by separate switches placed upon a switchboard. It is questionable, however, whether they really simplify the central station or are less liable to accident than with the old way, although they do somewhat lessen the work of changing over, etc.

At the far end of this building is Messrs. Siemens & Halske's principal installation, consisting of many direct-current dynamos of small size; direct-current machines coupled to alternators, one acting as a motor and the other as a generator, as the case demands; also two direct-current machines on the same shaft, one acting as a motor and the other a generator, their use being to transform a direct current of high potential and small current into one of low potential and large current, or *vice versa*. This is, of course, done at considerable loss. At one side stands their largest type of direct-current dynamos directly connected to an upright triple expansion engine. This is the apparatus from which the Edison company, in the United States, have modeled the new machines they intend to build for their future great central stations. The dynamo has an internal stationary field of four or six poles, according to the size of the machine, which are bolted to brackets on the foundation. Through a hole in the centre of the field the shaft revolves, keyed to which is the cast-iron web supporting the external revolving armature, the core being of laminated iron, bolted to the web, forming a Gramme ring. The winding consists of almost innumerable copper hoops, bent so that they exactly fit, insulated from each other and the outside surface turned off smooth, each hoop being one turn and forming one bar of the commutator. Thus the whole exterior of the armature is the commutator on which press as many stationary brushes as there are poles, supported by a very ingenious brush holder, so arranged that all brushes are moved together over the surface of the commutator by one motion, giving more or less lead, and by another altering the pressure of all brushes or removing them entirely from the commutator.

By the side of this great direct-current machine stands a new alternator directly connected to its compound vertical engine. This machine is of about the same size as the other, with an internal revolving field and an external stationary armature wound for a comparatively low electromotive force, for an alternating current. As the machine has as yet never been run, nothing is known as to the efficiency or the advantages to be gained by its form of construction.

In addition to those mentioned, there are a great many dynamos, engines, gas and petroleum motors with no peculiarly novel features, all doing their work and helping to make a wonderfully fine display.

A few common and prominent characteristics mark the difference between the European and American dynamos. In Europe designers favor commutators with a great diameter; a few are using small steel ones, with an air gap for insulation, copper brushes being always used; even for motors the carbon brush is rarely seen. Almost all European dynamos are built with a great clearance between armature and field, they believing that the loss in efficiency is more than compensated for by the better regulation of the dynamo. Americans believe that we make as close a regulating dynamo as they, and at the same time run with as small a clearance as is possible to make. The greatest difference, however, is that in Europe the tendency is toward great cumbersome machines running at a very small number of revolutions, while in America we make a compact machine running at a great number of revolutions and get as much service from a pound of metal as possible. Which is best? It seems as though the different conditions existing in the two countries demanded different apparatus.

Arc lighting in Europe is superior to ours, due chiefly to the use of much better carbons. There all arc lamps are operated in parallel, as we run incandescent lamps, and from the same machine. This custom demands the use of more copper in mains, but greatly simplifies the central station.

On emerging from this immense hot building we are greeted by the stars and stripes floating over a little round pavilion bearing a prominent sign, "American Bar;" it does not look entirely American, but they do know what a "whiskey sour" is! Close by is the gate leading to the exhibition of electric light projectors for marine use, situated on the river bank, with a light-house on which is one of the most powerful projectors ever made. Schuchert & Co. and Siemens & Halske monopolize this section, Siemens & Halske also exhibiting models of their torpedo firing apparatus, etc.

Schuchert & Co. have built a short electric street-car line from the main grounds to the Marine Department that deserves attention. For some time inventors have been trying to devise means by which both the overhead trolley system, and the underground conduit system, with its troublesome slot, may be done away with and yet avoid the use of accumulators. The most popular method has been the use of a continuous working conductor, temporarily connected to a sectional one, from which the motor derives its current. This has been done in many ways, but all have seemed too complicated. Schuchert & Co. make the connection by iron filings forming themselves into a column due to the action of a magnet carried on the car, the filings dropping back after the influence of the magnet has passed. In this way, only two sections can be electrified at one time and they are both covered by the car, the current being taken from the energized section by a brush bearing on a contact strip set into the pavement. The only novel feature is the use of the iron filings, the action of the magnet for this purpose and the sectional conductor being old; but it looks as though the use of the filings might so simplify the arrangement that it would be a practical success.

There are two small buildings devoted to a wonderfully beautiful display of electroliers from the works of some of the best European manufacturers. At the end of the grounds the Otis Elevator Co. has built a tower about 100 ft. high, up which one of its electric elevators carries passengers for 2½ cents to get a fine view of the exposition. On the side of the ground opposite the main building are three long ones, the first containing long distance and loud speaking telephones, Edison phonographs, etc.; also a very extensive exhibition of telegraph instruments of all kinds by most of the European makers. In one part of the next building are shown some systems of railroad interlocking signals and other apparatus for railroad use in which electricity plays a more or less important part. Nothing important, however, is new. In this building two manufacturers show portable electric light plants intended to be drawn by horses; boiler, engine, dynamos, poles, wire and lamps, all well arranged for instant use. On one a Westinghouse standard engine is used, and on the other a Brotherhood, both directly connected to their dynamos.

The Royal Prussian Railroad exhibits a car carrying an electric light plant, of larger dimensions than the two just mentioned, for use in case of accidents. In one end across the car is a boiler with firebox on the side. Close to the boiler is a Westinghouse engine belted to a dynamo, 10 feet toward the center of the car, which is the largest I saw in Europe side and admirably arranged with everything necessary ready and in convenient position for instant use. The poles and wires are carried on the roof.

The third building is devoted to an interesting exhibition of apparatus for various electrolytic processes, shown in operation, and also some of the products. The Algemeine Electricitats Gesellschaft has a large and interesting collection of the articles made in its Swiss works from pure aluminum and its many alloys, which may be considered in one sense products of electricity.

The proposal to transmit 300 HP. from Lauffen to Frankfort, 110 miles, has made the Frankfort Exposition most notable in America, although the work is not yet under way and cannot be completed before Sept. 1, if so soon. The intention is to use a multiphase or rotating current of 30,000 volts; the results of the experiment are awaited by the electrical world with bated breath, and if successful, will enlarge our present views of what is practicable in electric transmission of power.

It will be impossible to realize the size and interest of this exposition from such short and very general notes as these, but some conception of it may be formed from the fact that the boiler power, with that of the gas and petroleum motors, is 3,800 HP., much of which is again delivered in additional power by electric motors, making in all about 4,800 HP. in use every night.

The pleasantest time to visit the exposition is about five in the afternoon, and after four hours' hard work we come out of the electrolysis building tired and hungry. At the sight of the Munich beer garden brilliantly lighted, the pretty Bavarian girls in their native peasant costumes, covered with bangles and bright decorations, running in and out among the little tables filled with contented Germans, with now and then one of another nationality, we are immediately conscious of an irresistible thirst; but with a litre of beer before us we soon become as happy as the rest, and finish the evening in listening to a good military band and the latest gossip in German, while watching the crowd.

F. B. H. PAINE.

RAILROAD GAZETTE

Published Every Friday,
At 73 Broadway, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Poor's Manual ought to give the most accurate figures yet published of the new construction of railroads in 1890. There has, at any rate, been time for verification. The total increase from 1880 to 1890 inclusive was 80,233 miles, or 92.6 per cent. This was an average of about 7,300 miles a year, so that 1890 fell 1,800 miles short of the average. As we have recently said, 1891 will probably show even a less increase of mileage than 1890. This increase, it must be noted, is not the same as the new amount of lines built, but it is *net* increase; a small correction has been made for line abandoned, etc. Thus, Poor reports the new road built in 1890 as 5,739. The *Railroad Gazette* reported this, the second week in January, as 6,027 miles. The *Gazette's* early figures were therefore correct to less than five per cent. if Poor's figures, published now, are to be taken as the final authority. This, we take it, is close enough for all the purposes for which early statistical information is published or used.

One will naturally be skeptical as to the correctness of the table of rolling stock published on another page, from advance sheets of the introduction to Poor's Manual. It will be seen that, beginning with the year 1877, the number of freight cars increased in each successive year as follows: 31,000, 57,000, 59,000, 109,000, 82,000, 48,000, 20,000, 7,000, 40,000, 105,000, 55,000, 46,000 and 10,000. These are round numbers, and the last is for the increase from 1889 to 1890. Now, it is hard to believe that there were any such fluctuations, if so it is a hard fact for the car builders. We know that there were over 100,000 freight cars built in 1890 and over 70,000 built in 1889. How many *more* than these were built we do not know, but certainly there were not less. It is not impossible that 90,000 cars should be absorbed in a single year to fill vacant numbers after the stock has reached over a million. Indeed from the general estimates of the life of a freight car it is likely that as many as 90,000 cars are absorbed in one year without adding to the amount of equipment, especially if the renewals for a year or two before have been small; but what must surprise one is the very wide fluctuation in the additions from year to year. They show that car building must be one of the most uncertain businesses that one can engage in. The vast number of cars absorbed to fill vacant numbers explains also how, after two busy years in the car shops, good crops may bring a "car famine."

The wheat crop of Kansas is estimated by the Kansas City *Times*, after careful investigation, at 59,475,000 bushels, the acreage being 3,832,000 acres. A correspondent of the *Railroad Gazette*, who has recently passed through a considerable portion of the state, reports that, while the wheat crop is beginning to move freely in the southern and western portions of the state, threshing in the central and eastern portions has been delayed by rains. The No. 2 wheat is being largely stacked, and that which is moving now will not grade above 3, except for small lots. A considerable amount is being taken by mills. Unless the farmers take up with the Alliance schemes and hold their crop, it will commence to move freely within the next two or three weeks. Interviews with prominent farmers in all parts of the state developed the fact that they are not so much inclined to put faith in the Alliance movement as they were a few months ago. Corn everywhere looks well and promises a large yield. With the exception of some that was planted late it is now beyond the possibility of damage by drought. The crop of oats will also be heavy, while the fruit yield is simply enormous. All in all, Kansas is experiencing a "fat year," and it is to be hoped the farmers will profit by it. The railroads are sure to be taxed to their utmost to move the crops, and there will be no occasion for excessive competition. The Atchison, Topeka & Santa Fe controls the larger portion of the Kansas mileage, and is the best equipped for the grain business. The Rock Island has the next best equipment, and the Missouri Pacific comes third.

The situation in Kansas is different from that in other western states only in matters of detail, as our readers know. The pressure for cars is already being felt on all the Western roads, and the receipts of grain at Chicago are increasing rapidly. Orders for new cars have no more than kept pace with the increase of mileage of road and depreciation of cars, and in view of the financial uncertainties of the past months it is perhaps true that the actual supply is less per mile of road than last year; so that even if the crops had been no greater than in 1890 the crisis would still have been serious. It will be interesting to observe the effect of the Chicago, Milwaukee & St. Paul's admonition to the coal dealers. Many of them doubtless order large quantities at this season without urging, and much of the coal moves in a direction opposite to that in which grain must be carried, so that the railroads ought to be able to take it at any time; but where a dealer wishes to postpone his purchases for financial reasons it is not easy to see how a mere "appeal" (to sacrifice his interests to those of the grain men) can be made to greatly affect him. Judging by the conduct of shippers generally, such customers will be more inclined to take their own time, putting a sublime trust in their ability to compel the roads to furnish two cars when only one is available. All-rail rates from Chicago eastward have not yet shown any improvement, but it is not impossible that the Lake lines will soon be so well supplied with loads as to throw upon the railroads some of the freight that would naturally go by water. The roads east of Buffalo seized the opportunity presented by the serious break in the Erie Canal to advance rates a little earlier than would otherwise have been possible, and regular lake-and-rail rates from Chicago to the seaboard have now been advanced 3½ cents per 100 lbs. Lake rates to Buffalo on wheat advanced three cents a bushel. The large movement has also increased ocean rates, and the freight from Chicago to Liverpool advanced two cents a bushel within two days.

The vessel men are naturally the most jubilant of all those affected by the boom, and they are talking of at least four cents for wheat to Buffalo in the immediate future, which, they say, will take the bad taste out of their mouths left by the one-cent rate of last spring. It is claimed that four cents per bushel to Buffalo has been refused for October and November. Wheat is now coming into Chicago at the rate of 800 to 1,000 cars a day, and much is sold for shipment the last of this month without contracting for Lake freight. Iron-ore shipments have been so far behind those of last year that the Lake papers seem ashamed to publish them, but the *Marine Review* figures on some 3,000,000 tons yet to be brought down, the sales so far having been about 1,500,000 tons more than generally reported. It is expected that the docks will be entirely bare of ore in the spring, and the Chicago *Inter-Ocean* says it is probable that orders for new boats will be given out soon. Very little shipbuilding is now being done on the lakes except at the Wheeler yards on the government vessels, and at Superior City.

United States Railroads in 1890.

The annual issue of Poor's Manual was long the only body of statistics covering the whole railroad system of the United States, and the aggregates of mileage, traffic, earnings, stocks, bonds, etc., given in the introduction to the work, have afforded us material which we have often used to trace the progress of our railroad system, and the fluctuations and tendencies of its business. The official statistics by the Interstate Commerce Commission, collected on a uniform system, through an office which has authority to require definite information from all companies, and intelligence to criticise, check and correct errors, would naturally, we might suppose, completely supplant the *general* statistics of a private publication like Poor's Manual; the more so because the work has always been imperfectly done in the latter, the computations being insufficiently checked and the totals sometimes containing enormous errors, so that conclusions drawn by analyses which accept the manual's figures as a basis are liable to be false.

But so far the Interstate reports have come too late to have much practical value. Nearly all statistics which affect business operations vary in value inversely as the (say) square of the number of months that have elapsed since the facts reported occurred. Figures three months old as compared with figures 18 months old are worth in the proportion of 324 to 9. The statistics of 18 months ago may show very clearly how the railroad or other business interested committed a great folly; but the statistics of three months ago will go far to prevent its committing such a folly. Government statisticians the world over, however, seem to regard *completeness* as outweighing all other considerations, while in fact *freshness* is of unspeakably greater importance. The absence of 2 or 3, or even 5 per cent. of the enterprises from a report on a great national industry rarely makes such a difference as to vitiate the conclusions drawn from such statistics, but a few months' (in some industries, a few weeks') delay may very greatly lessen their value.

However, if Poor's Manual brings us earlier information than the Interstate Commission report, its statistics can hardly be called "fresh." Here in August we have figures which, in the case of perhaps half the companies, are for the year ending June 30, 1890, while very few come down to a later date than Dec. 31 last. With the irregular dates of the close of the companies' fiscal years, of course the totals of the Manual's introduction do not represent the condition of railroad affairs for any definite twelve months; and the tendency to change corporation fiscal years to that ending June 30, since the State Commissions have generally adopted that year of the Interstate Commission, probably makes the present issue of the Manual, on the average, more out of date than any previous issue. Until recently only a few companies reported for the year ending June 30, and by far the larger number of companies which did not report for the calendar year had a year ending with September—the year of the New York, the Ohio and the Massachusetts State reports, and the average of the mileage reporting operations in the Manual was probably as late as Oct. 31. This should be borne in mind in comparing with other recent years, and it probably affects particularly comparisons with the last previous issue of the Manual.

The mileage of railroad in operation at the close of 1890 has apparently been carefully ascertained. It is given as 166,817 miles, which is 5,498 miles more than at the beginning of the year, an increase of 3.4 per cent., which is considerably more than the average rate of increase of the population of the country. The increase in 1889 was at nearly the same rate (3.3 per cent.), and was the lowest since 1885, and with two exceptions the lowest since 1875. With the present enormous mileage, however, an increase of 3 per cent. makes 5,000 miles, and we shall not probably see again an increase of 10½ per cent. as in 1881, of 11¼ per cent. as in 1882, or of 9½ per cent. as in 1887. In the light of the recent census we find that there were at the beginning of this year about 388 people in the country for every mile of railroad, against 581 at the beginning of 1881, and it is evident that the increase of 79 per cent. in railroad mileage during the past decade, against an increase of 25 per cent. in population, cannot be kept up. It would give us nearly 300,000 miles of railroad in 1900, to be supported by 78,000,000 people —260 per mile.

The railroad system, however, has not grown faster than the railroad traffic. The statistics of traffic given in the Manual begin with 1882, and do not cover quite the whole mileage. But the mileage reporting operations increased 65 per cent. from 1882 to 1890, while the passenger traffic (passenger-miles) increased 54 per cent. and the freight traffic over 100 per cent. in that time.

That the increase of railroads was out of proportion to the demand is better indicated by the fact that with this 65 per cent. increase in mileage, passenger earn-

ings increased but 45 per cent., and freight earnings but 52 per cent.. and probably not nearly half of the increase was on, or due to, the new mileage. And most significant of all, the *net* earnings increased only 24 per cent. The 3,511 millions of capital stock in 1882 received $102,000,000 in dividends; the 4,640 millions of stock in 1890 a little less than $84,000,000 in dividends—an average of 2.90 per cent. in 1882, and of 1.80 per cent. in 1890. So the 3,505 millions of debt paid $154,000,000 interest in 1882; while the 5,383 millions of debt in 1890 paid $229,000,000 interest—an average of 4.39 per cent. at the earlier date, and of 4.25 at the later. With an addition of 3,607 millions of stock and debt, there is an addition of but 57 millions to the interest and dividends—less 1.9 per cent.

The above statements, of course, have no more value than the statistics on which they are based. The discovery of a little error of 653,000,000 in the statement of the passenger mileage of 1882, due to a gross blunder in computing the figures for the single State of Illinois in 1882, perpetuated in the new Manual in the table for the "Central Northern States," makes us hesitate to affirm positively any deductions from tables where, in one instance at least, the statistician footed up a total of 87 odd millions for columns which, added by the arithmetic prevailing in this office, make nearly 741 millions.

Of the 62,234 miles of railroad added since 1882 no less than 44,902 miles are west of the Mississippi and in the five states east of the Mississippi which are west of Pennsylvania and north of the Ohio River. This is 72 per cent. of the whole new mileage. Now, the same part of the country had 58 per cent. of the national increase of passenger traffic and 54 per cent. of its increase of freight traffic. Further, the roads west of the Mississippi (not including the Pacific Coast), which increased no less than 28,292 miles in length, had but little more increase in passenger and a fourth less increase in freight traffic than the five "Central Northern States" next east of them, whose lines increased but 16,700 miles, but through which passes the larger part of the through traffic to and from the trans-Mississippi States. Relatively, however, the growth of traffic has been large also in the South, the South Atlantic States having an increase of 115 per cent. in passenger and 243 per cent. in freight traffic, and the Gulf and Mississippi Valley States (Kentucky, Tennessee and the three Gulf States directly south of them) an increase of 96 per cent. in passenger and 305 per cent. in freight traffic—gains which indicate the changed condition of things in a territory which until recently changed very slowly.

Ordinarily, the comparison with the previous year is the most interesting use that can be made of the Manual's statistics. But, as we have said, the figures in this issue represent a condition of things which existed a year ago or more, and has changed greatly since. The lines whose capital is reported were 3,426 (2.14 per cent.) larger in 1890 than in 1889, with 145 millions (3.2 per cent.) more capital stock, and 277 millions (5.7 per cent.) more bonds. The mileage of roads worked increased 2.7 per cent., the gross earnings 9½, and the net earnings 7.7 per cent. The increase of 4.6 per cent. in passenger traffic was accompanied by a somewhat larger increase in passenger-train mileage, the average trainload being but 42.12 passengers, which, with one exception, is the smallest on record. But the average passenger rate falls, nevertheless, having been in cents per mile:

1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
2.31	2.42	2.35	2.20	2.18	2.27	2.24	2.17	2.19

The freight traffic, which increased 15.3 per cent. from 1889 to 1890, was carried with an increase of 12¼ per cent. in freight-train mileage, there having been a continuation of the increase in the average freight-train loads which has been going on so long; this average load, which was 129 tons in 1882, became 164 in 1890, and it alone has made possible the decrease of nearly one-fourth in the average freight rate since 1882. These rates have been in cents per ton per mile:

1882.	1883.	1884.	1885.	1886.	1887.	1888.	1889.	1890.
1.23	1.22	1.12	1.01	1.04	1.03	0.97	0.97	0.93

The year reported in the Manual—that is, the year of the larger number of company reports contained in it—was a favorable one in many respects. Both passenger and freight traffic were larger than ever before; and so were gross and net earnings. The amount paid for interest and dividends was 3.03 per cent. on the aggregate of the stock, bonds and other debt, which is just the same as in 1889 and 1888, but less than in previous years.

In most particulars the showing made by the next Manual, covering substantially the 12 months just expired, will probably be less favorable than that for 1890, unless a great decrease in working expenses, which in many cases is equivalent to borrowing money at very high rates of interest, should be regarded as favorable. But if the present crop prospects are realized, long before a new Manual appears the railroad managers will be more engaged in finding means to dispose of the traffic offered than in heroic reduction of expenses.

Blue Shortness.

At the last railroad conventions the attention of the members present was called to a peculiar weakness of iron and steel at a blue heat, and the attitude of those present and the interest shown in the subject and in the samples exhibited, suggested that this peculiar action of some metals was not generally known. Further inquiry indicates that many metal workers do not appreciate the danger of working iron and steel at a temperature varying from 430 to 600 degrees Fahrenheit, which is the range during which a piece of polished iron or steel will have a blue color.

This is not a new discovery. It has been known in some of the older English iron works for more than 50 years. In 1886 Stromeyer presented a paper to the Institution of Civil Engineers, England, entitled "The Working of Steel," which contained a rather exhaustive review of the knowledge extant at that time regarding the effect produced on steel by working at different temperatures. This paper was well discussed at that time.

Mr. Howe, in his recent work, "The Metallurgy of Steel," devotes considerable space to the characteristics of steel and iron when at the temperature indicated by a blue color of a polished surface when cooling from a red heat, and when heated to the blue color from a normal temperature. This characteristic Mr. Howe termed "blue shortness." It is indicated by the steel or iron becoming brittle and losing its ductility and resilience. Mr. Howe says:

"The loss of ductility as measured by endurance of bending and drifting is enormous; that this is not due to incipient cracks is shown by the simultaneous increase of tensile strength, and by restoration of ductility by annealing. Heating to redness may completely remove the effects of blue working. There is such a general resemblance between the effects of cold and those of blue working, that we may suspect that the immediate effect of these two operations is identical in nature. It is true that the gain in elastic limit does not seem to excel that in tensile strength as markedly in case of blue as in case of cold working, nor is it clear that the tensile strength and elastic limit increase during rest after blue, as they do after cold working. But this is natural; for we saw reason to believe that heating cold-worked iron to blueness greatly accelerated the changes which cold working starts; so that when this change is started by distortion at blueness, instead of in the cold, it may occur so rapidly and so nearly reach its full growth before the metal grows cold that no considerable further change occurs thereafter. The effects of blue working are more intense and more injurious than those of cold working. . . . Out of sixteen comparable cases the previously worked blue pieces endure, in 18 less than 50 per cent., and, in 11 less than 25 per cent. of the bending endured by the corresponding cold-worked piece."

Stromeyer stated that the fracture at blueness is silky, although the steel acted as if it was what would be termed by blacksmiths "rotten." Blue-worked pieces, however, when cold show a crystailine fracture. Howe says that Valton found that his workmen had long recognized blue shortness and avoided hammering at blueness.

We are inclined to believe that American engineers do not as a rule understand that blue shortness is of sufficient importance to cause them to forbid, in their specifications, blue working of iron and steel; but it is common to forbid working below a red heat, which probably covers the point. Blue working was rarely permitted for steel in the Forth Bridge. Probably American boilermakers appreciate better than any other class of mechanics the effect of working steel at this critical temperature. This is naturally so because they are more tempted to do this than other metal workers, owing to the time taken and required to fit up sheets closely in erecting boilers, and to decrease the expense of construction, which must be considerably augmented where sheets have to be repeatedly reheated in order to keep them at a red heat during the time required in driving up flanges. The following, from Mr. Howe's book, regarding the working of boiler sheets at a blue heat is pertinent:

"It is said that some boilermakers allow no blue-working, stopping work when the metal becomes so cool that it no longer glows when rubbed with wood; others stop while the metal is still visibly red. Others insist that it is necessary to adjust some work, *e. g.*, marine boiler fronts, at blueness; that, despite the most careful hot working, adjustment is needed after the distortion due to cooling, especially as, owing to the endless variety of patterns, flanging in the press at a single heat is not practicable; that adjusting cold would lead to excessive waste of time, as iron is bent more quickly at blueness than when cold; hence these pieces are warmed locally to blueness by applying hot irons. To anneal afterward would be useless, as fresh adjustment would be needed after cooling. Certain it is that most Americans, and at least many foreign boilermakers, habitually adjust at blueness. Blue working without subsequent annealing is forbidden for boilers for the United States Navy, but not for the hullwork."

The Pennsylvania Railroad, which has perhaps more interlocked signals than any other road in the country, certainly more than any other but one, is constantly making enlargements of old towers and erecting new plants which in themselves constitute a respectable addition to the interlocking of the country. The New York Division is now undergoing extensive changes needed to convert it into a four-track line. At first the outside tracks were used only for freight trains, and they were neither as completely signaled nor as perfectly maintained as the high-speed tracks; and it is only within a year that they have been completed in sufficiently long continuous stretches to warrant their use for all kinds of trains. Now, however, the line from Philadelphia to Trenton, 34 miles, has been brought to standard for the whole distance, and passenger trains use the outside tracks. This is of course the natural plan where the stations are not between the tracks, especially for accommodation trains. Proper crossovers, interlocking and distant signals being provided, passenger trains can now be run around one another by the use of the inside tracks whenever such a course is sufficiently important to justify detaining freight trains for the purpose. In point of fact this is now done very frequently, not only without stopping either train, but without bothering either the conductor or the engineer with a train order, the instructions to the train being given wholly by means of the semaphores. The freight trains are held by the semaphores, and every freight and passenger engineman has instructions providing that when a semaphore is pulled off for him he has the right of road for the track indicated, whether it be his regular track or not. Within the next two months it is expected to use the outside tracks (No. 1 and No. 4) for passenger trains between New Brunswick and Newark, 22 miles, and to this end an interlocking tower of 43 levers is under construction at West Newark Junction. Changes will also be made at Waverly, 10 additional levers being put in. At Perth Amboy Junction the arrangement of switches will completely remodeled, and a 53-lever machine put in use to replace the present 25-lever machine. This tower and machine will be one of the largest on the New York Division, the tower being 14 ft. 10 in. wide and 32 ft. 1 in. long. At East Brunswick the switches are being changed, and a new 20-lever tower erected to take the place of the present one containing 12 levers.

The five difficult pieces of road yet to be rebuilt are Jersey City, Newark, Elizabeth, New Brunswick and Trenton. The elevated line in Jersey City, now in course of construction, is familiar to our readers. At Newark and Elizabeth matters are yet undecided; freight tracks will be built around Newark. At New Brunswick an elevated line will probably be built next year. At Trenton, where the passenger station is between the tracks and tunnels, overhead bridges, canals and sewers are almost inextricably mixed, a new passenger station is already begun some distance from the old one and on a higher level. When this is done, about October, the re-arrangement of the tracks for a four-track line, a large undertaking, will be begun. At the crossing of the Delaware River, a short distance west of the station, the bridge will be widened for two additional tracks, making perhaps the most important four-track bridge in the country.

The record of speed across the Atlantic is again lowered, this time by the "Majestic," of the White Star Line. She reached Sandy Hook Wednesday, Aug. 5, in 5 days 18 hours and 8 minutes from Roche's Point. The best previous record, which is accepted as authentic is that of the "City of Paris," which completed the voyage Aug. 28, 1889, in 5 days 19 hours and 18 minutes. It is claimed that the "Teutonic" made the westward passage in August, 1890, in 5 days 19 hours and 5 minutes, but this is disputed. The daily record of these three voyages is as below:

	"Majestic."	"City of Paris."	"Teutonic" (disputed).
First day	470	432	473
Second day	501	493	496
Third day	497	502	512
Fourth day	501	506	500
Fifth day	491	509	485
Sixth day	317	346	340
Total	2,777	2,788	2,806

The "City of Paris" still has the record for the greatest run in one day, viz., 515 miles.

On complaint of the people of Greenfield, Orient, Bridgewater, Fontanelle and Massena, the Iowa Railroad Commissioners have ordered the Chicago, Burlington & Quincy to improve the train facilities on the Cumberland branch of the road. The people were unable to reach Creston and return to their homes the same day. The Commission lays down the general principle that trains carrying passengers should, if possible, be run in such manner as to enable the people living on the line to visit

the principal town of supply in the forenoon, returning in the afternoon. This is the same question that recently came up in Kansas. Can it be that we have here an indication that the Western roads have a penchant for making rural residents go to town nights instead of in the day time? If they thus promote a love of darkness rather than light and encourage dissipation generally, they will have the license commissioners as well as the railroad commissioners after them. Kansas and Iowa are prohibition states. They don't want their towns painted red.

Director Jeffery, of the World's Fair, has practically completed arrangements with property owners for the acquisition of a right of way from a junction with the Baltimore & Ohio tracks at or near Seventy-fifth street to the southeast corner of the exposition grounds. It is to be 50 ft. wide and four tracks will be laid. The directors will ask the Baltimore & Ohio, in return for the privilege of using these tracks, to admit the trains of all roads which connect with the B. & O. at South Chicago, which will undoubtedly be done. Director Jeffery is quoted as saying, "My honor is staked on providing ample facilities for every railroad to enter the Park." It is understood the committee is considering several schemes for railroad connections in other directions.

The Columbian World's Fair.

In starting out to give a brief statement of the present condition of this enterprise, we wish to record once for all our protest against its name. Of course it will do no good to protest, but one may at least have the satisfaction of speaking his mind. Why under the sun should it have been called an exposition instead of exhibition, or just a plain fair? In old times the simple and short English word fair was good enough. This was gradually crowded out by exhibition, and in recent years the French word exposition has been adopted. The only reason for it is that somebody has thought the word more elegant, just as people west of a certain longitude say gotten when they mean got. With this preliminary growl in the interest of the vernacular we shall cease to make any protest against the scope or management or conduct of the enterprise until there is a better reason for criticism than is now apparent.

After very tedious and discouraging delays the affairs of the exposition seem to be on such a footing that we may expect them to go on to successful completion. The site finally decided on as best suited to the needs of the Fair, Jackson Park, lies in the south part of the city along the lake front, and is the east portion of the south park system, and the midway Plaisance, about 600 ft. wide, connecting Jackson and Washington parks, the latter lying about a mile to the west. Contract work, the aggregate of which is considerably more than $3,500,000, is now in progress at Jackson Park. The construction of the buildings is fairly under way. The time within which the structures must be completed is short for work of such magnitude, but this is fully realized by the Construction Department and accordingly precautions which, it is believed, cannot fail are being taken to insure the readiness of everything for the ceremonies of dedication on Oct. 12, 1892.

Contracts have already been let for eight of the buildings. These buildings, their architects and contractors, are as follows:

Mines and Mining.—S. S. Beman, Architect, Chicago.

Carpentry work, Barnett Rickord & Chapman	$99,500
Ironwork, King Iron Bridge & Manufacturing Co	57,525
Exterior covering, Phillipson Decorative Co	34,800
Roof and skylight	21,656
Other items	12,635
Total	$229,116

The style of the Mines Building is classic, and its dimensions 700×350 ft., with the height of the main cornice 65 ft. There is a pavilion at each of the four corners 85 ft. square and 90 ft. in height, surmounted by a dome. Entrances to the building are on either side, besides the grand entrances at each end, which latter are 110 ft. high and 32 ft. wide, opening into vestibules. A 60-ft. balcony extends entirely around the building, and the roof, of glass, is 100 ft. from the floor. Total cost of the structure is estimated at $350,000.

Electricity.—Van Brunt & Howe, Architects, Kansas City.

Carpentry and ironwork, Arthur Johnson & Bros	$164,444
Exterior covering, Parke & Bates	85,000
Roof, James A. Miller & Bro	22,100
Other items	19,992
Total	$291,536

This building, 700 × 350, will be 60 ft. high and one of the handsomest of the central group, having four entrances, the main one facing south.

Manufactures.—George B. Post, Architect, New York.

Ironwork on dome, King Iron Bridge & Mfg. Co	$34,600
Exterior covering, Smith & Camp	173,000
Carpentry and ironwork, Agnew & Co	453,892
Painting and glazing, W. H. Stubbings Co	23,746
Roof, James A. Miller & Bro	119,142
Other items	29,875
Total	$831,255

Woman's Building.—Sarah G. Hayden, Architect, Boston.

Carpentry and ironwork, Steinmetz & Eilenburger	$52,587
Other items	45,160
Total	$97,747

Horticulture Building.—W. L. B. Jenny, Architect, Chicago.

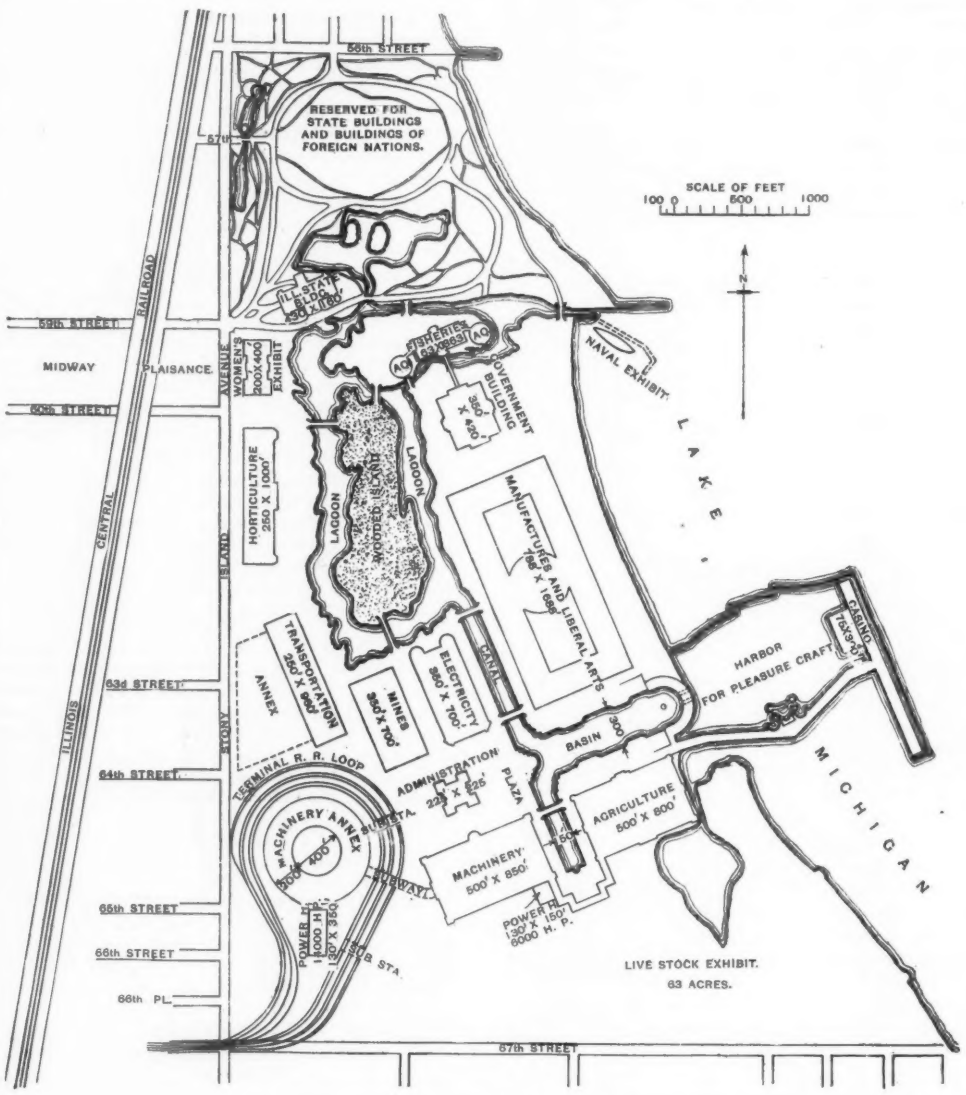
Ironwork on dome, Probst Construction Co	$30,140
Exterior covering, Cudahy, Nelson & Vanderbergen	47,000
Carpentry work, McArthur Bros.	90,500
Roof, James A. Miller & Bro	43,346
Other items	15,861
Total	$226,887

The Horticultural Building is in three pavilions, connected by front and rear curtains, forming two courts, each 88 × 270. The centre pavilion, 187 ft. in diameter and 113 ft. high, with a crystal dome, will contain the tallest palms, bamboos and tree ferns procurable. Each pavilion has a gallery, those in the two ends being utilized for cafés, having arcades on both sides, from which views of the grounds may be obtained. The exhibits requiring extra height will occupy the rear curtains, which are covered with glass roofs close to the plants.

Transportation.—Adler & Sullivan, Architects, Chicago.

Carpentry work, Goldie & Sons	$117,500
Exterior covering, Phillipson Decorative Co	43,557
Roof, Smith & Cade Co	30,580
Other items	12,471
Total	$204,108

The main building of the transportation exhibit measures 960 ft. front by 256 ft. deep; from this will extend westward to Stoney Island avenue a triangular annex covering about nine acres, and consisting of one-story buildings, 64 ft. wide, set side by side. As there will be a railroad track every 16 ft., and as all these tracks will run east and west, these annex buildings may be used to exhibit an entire freight or passenger train coupled up with its engine. It is likely that the display of locomotive engines will be great.



THE SITE OF THE COLUMBIAN WORLD'S FAIR.

Administration Building.—R. M. Hunt, Architect, New York.

Carpentry work, Steinmetz & Eilenberger	$102,811
Ironwork on dome, Mt. Vernon Bridge Co	55,000
Exterior covering, Smith & Crimp	111,000
Other items	23,491
Total	$291,232

Architecturally this is considered the gem of all the buildings. It consists of four pavilions 84 ft. square, one at each of the four angles, the central dome being 120 ft. diameter and 260 ft. high. The entrances are in a recess in the centre of each façade. Externally the design is in three principal stages—the four pavilions (65 ft. high) corresponding to the surrounding buildings; next a continuation of the central rotunda, of the same height and 175 ft. square, and the third, the base of the dome, 40 ft. in height and octagonal, from which the dome itself rises.

Agricultural.—McKim, Mead & White, Architects, New York.

Carpentry work, W. Mayor	$244,450
Painting and glazing, Reilly & Barker	49,243
Exterior covering, J. Eastman	87,000
Roof, W. B. White	82,943
Total	$463,636

This building is to be one of the finest structures, and is nearly surrounded by lagoons. It measures 800 × 500 ft., and its main features are its five pavilions, those on the corners being 64 × 48 ft. square. The main entrance, 60 ft. wide, is on the north, and leads into a vestibule 30 ft. deep by 60 ft. wide. The rotunda is 100 ft. in diameter and 130 ft. high. There are eight lesser entrances 20 ft. wide, and the roof is principally of glass.

The main machinery building measures 850 × 500 ft. There will be traveling cranes running from end to end of the building. These will be useful in moving machinery, and when the Exposition opens platforms will be placed on them for visitors. Steam power will be used throughout this main building, and this steam will be supplied from a main power-house adjoining the south side of the building. The machinery annex will be of wood. Its shape is peculiar. It is to be annular in form, the outer diameter being 800 ft. and the inner diameter 400 ft. The building will have a nave 100 ft. wide, with a 50-ft. wide lean-to in one story on the inside and a 50-ft. wide lean-to on the outside. Within the inner circle will be a park in which visitors may rest. The annular form chiefly commends itself because a circuit electrical railroad can run continuously around the entire main nave, and passengers in it can thus see the entire exhibit without leaving the cars, and machinery can be easily moved by this means. The power will be transmitted by shafting crossing the building at each bay, with a motor at each shaft. Electrical power will be used in the annex and steam power in the main machinery building.

The several amounts mentioned above do not, of course, represent the entire cost of the respective structures. There will be necessary a large expense to cover lighting, furnishing water supply, plumbing, etc. The contract for the Fisheries Building will be let within a few days, and at intervals during the next month will follow contracts for other buildings.

The contract for the pier and breakwater have been let to Hiero B. Herr & Co. for $80,000. Shailer & Schniglau have been given the contract for the pier at which will be moored the imitation battleship containing the Government's naval exhibit. Numerous other contracts, large and small, have been let, some of which have already been fulfilled. Chief among these is that for grading, filling and dredging. McArthur Bros. took that at $399,872. Another contract is the temporary railroad for construction purposes: Ties, F. B. Stone, $8,630, and Mueller & Raber, $8,500; iron and steel, Ajax Forge Co., $2,000; rails, Illinois Steel Co., $22,048; total, $41,178. A contract has been signed whereby the city of Chicago agrees to furnish the exposition with water at $20 per million gallons, the exposition company to advance $200,000 for the construction

of pumping works, and the city, at the close of the exhibition, to own the works and refund the $200,000.

All of the great exposition buildings erected by the construction department are to have roofs of iron and glass. All of them are to have an exterior covering treated to represent marble, granite or other stone. Quite a number of the states have planned to construct their buildings of permanent building materials such as are found in their respective limits. Plans and specifications for a number of the state buildings, including that of Illinois, are completed and the contracts are about to be let.

The U. S. Government has already let the contract for the construction of the imitation coastline battleship which will contain its naval exhibit. It has also called for bids for its main building, which is estimated to cost something like $400,000, and the contract will be let in August. For its buildings and exhibits the government made an initial appropriation of $1,500,000.

Following are the foreign nations and colonies which have officially decided to participate in the exposition: France, Great Britain, Germany, Spain, Japan, China, Mexico, Peru, Honduras, Salvador, Costa Rica, Colombia, Cuba, Guatemala, Jamaica, Chile, Nicaragua, Persia, Turkey, Denmark, Egypt, Ecuador, British Honduras, Russia, Hayti, Siam, Trinidad—28.

The important matter of regulations and rates for the transportation of exhibits is now receiving a great deal of attention, and full arrangements are nearly completed. Important concessions have been secured from a number of transportation lines. As soon as all points are fully agreed upon, these arrangements will be published in detail.

The Central Traffic, Trunk Line and New England associations have agreed to transport all articles to the exposition at regular rates, and to return the same free of cost, excepting in cases of horses and other valuable and fancy animals, upon which tariff rates will be charged in both directions and the established regulations observed.

The Western Traffic and Transcontinental associations have agreed to make the same concessions as have the Eastern associations, and make no exception in case of live stock.

A meeting of representatives of the various trans-Atlantic steamship lines has been called in New York, and it is expected that a reduced rate on articles for exhibition will be agreed to.

Negotiations have been under way by which an entrance into the fair grounds might be had by the B. & O. Railroad. At present the only line having tracks into the grounds is the Illinois Central, which runs along the west side and switches in at the southwest corner. These main tracks are also used by the Michigan Central and the "Big Four." The directory took up the matter of trying to lease property south of the fair site sufficient for a 50-ft. right of way down to the B. &. O. present tracks. This property is very valuable, and on account of pending deals in one or two cases there has been a reluctance on the part of the holders to granting the roads the right to cross. This lease to the directory has finally been obtained, however, for a nominal sum, and it now remains for the proposition to be accepted by the Baltimore & Ohio on condition that it allow all other roads to use the tracks for an entrance. The main lines of the Pennsylvania and Lake Shore roads run within a short distance of this corner of the park; also the Rock Island, the Western Indiana, and the Belt Line run into South Chicago, and will therefore be able to make good connections through these tracks, and as the Belt Line taps all the roads entering the city it will give those from the west and north an opportunity for switching trains directly to the exposition, thus insuring what has been contended for so long—equal advantages and ample railroad facilities for exhibitors from all directions.

The transportation committee has reached an agreement with the Illinois Central regarding the rate to be charged for handling freight for exhibits from junction points, within the city, to the exposition ground of 3 cents for 100 lbs., subject to this condition: that, where the Illinois Central receives the cars properly sealed, and delivers them to the exposition grounds, the exposition company shall receipt for them, and shall relieve the Illinois Central of any liability for any shortage below the bill of lading or for any damage in transit; or, in other words, the exposition company undertakes to insure shipments against such loss.

Papers at the Car Accountants' Convention.

The papers read at the last annual meeting of the Car Accountants' Association at Denver in June have never reached this office, although we endeavored to get copies from the Secretary. They have, however, arrived in good condition at the office of the *Official Equipment Guide*, whose publisher is Secretary of the Association, and they are printed in full in the August number of that publication. We print below the essential portions of those which are of interest to our readers.

KEEPING A DETAILED RECORD OF CAR SEALS.

Mr. C. H. Cannon, of the Great Northern Railroad, presented a paper giving the successful experience of his road in stopping pilfering and reducing "concealed losses." He said: Our seals are numbered consecutively in series of 100,000, and we require the manufacturer to string them upon wires in lots of 100 arranged in numerical order. Where there are two or more presses used at the same station, each press has a distinctive die of two letters, of which the only complete register is in the car accountant's office. On April 1, 1890, we recalled all unused seals and seal presses issued prior to that date, and supplied to each station a new series of seals (changing the manufacturer temporarily as a further protection) and a new press. Agents were instructed to use seals in numerical order, and that they would be held personally responsible for every seal issued, and a penalty of 25c. would be charged for every seal unaccounted for. Agents forward to the car accountant a daily seal report which shows the initials and numbers of all cars to which seals are attached or from which seals are removed, with the numbers of the seals attached or removed. (The latter seals they are required to preserve.) All seals used are included in this report regardless of whether they are attached to cars which are going forward by train or are attached for temporary security during the day or over night while the car is being loaded or unloaded. Seals found to be imperfect or spoiled in use are so noted on this report. These imperfect or damaged seals, *together with all seals removed from the cars*, are forwarded to the car accountant daily with the seal report above mentioned. In the car accountant's office we have a seal record book which is arranged for 100,000 seal numbers—500 on a page or 1,000 on the two pages exposed when the book is opened. This book shows the name and number of the station to which the seals are issued, date of issue and number of the seals. It also shows the date the seal is used, to what car attached and where and when removed from the car; this information being entered from the agents' "Daily Seal Reports" as they are received. In case of the failure of an agent to report a seal the line upon which that number is given shows a blank space not easily overlooked, and the agent is promptly asked for its disposition.

Each conductor reports the number of every seal attached to the cars in his train, and any loaded cars which are not sealed, giving contents. On the back of his report a record is kept by the conductor of the seals removed from and attached to all cars in his train containing way freight. The car and seal numbers given on this part of the report are checked against the agents' daily report, and this checking has been very beneficial in enabling us to locate the responsibility for the pilfering of way freight, which we have practically stopped by this means.

The returned seals are carefully examined in my office by an inspector, and those showing any carelessness on the part of the person attaching the seal are laid aside, and afterward forwarded to the superintendent of the division on which they are used, with a report. You will observe that where there are two or more presses in use at a station we can locate definitely the party at fault, from the die of the seal press used. Superintendents call agents to account, and also take the conductors to task for not discovering seals in bad condition. I do not hesitate to assert that about three-fourths of the so-called concealed losses from theft throughout the country would be obviated if seals were properly attached and secured. When we first commenced our inspection we had more cases of bad and imperfect sealing than we had of those properly applied, but at present, out of the many hundreds of seals received in my office each day, we do not have an average of five seals applied on our own line which we have to report as imperfect, although our inspection has gradually become very rigid. A ledger account is kept with each station, showing the number of seals issued, etc. Are the results worth the expense involved? With 350 sealing stations it has cost us $75 a month for clerk hire. During the 14 months the system has been in force we have issued 30 per cent. fewer seals than formerly, thus stopping a considerable waste. Our freight claim department testifies that pilfering from cars has practically ceased. Our officers feel confident that stealing from side doors has decreased 85 per cent.

THE WASTEFULNESS OF MAINTAINING LINE CARS.

Mr. C. J. Fellows, of the Cleveland, Cincinnati, Chicago & St. Louis, read a paper on the improvement that could be effected if each road would put all its cars available for line freight into one class, marking them all alike, instead of assigning a number to each of several fast freight lines, and thus making them unavailable for use on any other line. The principal parts of his argument are condensed as follows:

In former years line cars made large mileage, but at the present time the daily average mileage is very little, if any, above that of the common cars, which include the coal, flat and others that may make short runs and consequently small mileage. For a few years after the organization of fast freight lines cars made from 65 to 85 miles per day, while to-day they make only about 25 miles. Circumstances have changed to such an extent that it is impossible to make line cars run as many miles per day as formerly. One of the circumstances is the use of common cars when at points of demand, to avoid hauling line cars long distances empty to places already too full of other empty cars. As everyone knows that the marking of the car has nothing whatever to do with the movement of the freight, that freight in common cars makes as good time as that in line cars, what is gained in marking them for any particular line? In the assignment of cars originally, it was with the view of equalizing the mileage, but as this was done by agreement, the mileage of common cars could also be equalized in the same manner. If all cars now in fast freight lines were marked "THROUGH FREIGHT" and all treated the same as line cars, it would obviate the necessity of hauling ten kinds of cars into important shipping points simply to have the cars of a fast freight line on hand via which a shipment may be ordered. Aside from the question of economy in handling the cars there is another and important one to car accountants, and that is the extra work and annoyance in keeping separate accounts for the line cars and reporting the mileage made by the same. It is a matter of interest to me to know how some lines manage without equipment bearing line marks, yet do a good business, without the annoyance of the care of the cars or mileage accounts, while others think it impossible to run a line without the cars being marked with its name.

REPORTING INDIVIDUAL MOVEMENTS OF CARS.

Mr. J. M. Daly, of the New York, Chicago & St. Louis, read a good paper on the value of individual records, which, among other things, would render unnecessary about three-fourths of the tracers. Mr. Daly continued:

Railroads receive and pay annually millions of dollars for car hire without the shadow of a record that will show the correctness of amounts received or paid, but accept the amount tendered by other companies as being correct. There is no other department in railroad service where the finance accounts are handled in the careless and slipshod manner that car-hire accounts are kept. We must admit that at least 20 per cent. of the amount due us can be withheld by dishonesty or the employment of careless assistants. During the year 1890 foreign cars made 1,080,000 local movements on our road. For each movement there are four chances for errors, hence we had 4,032,000 chances for error in computing our mileage before we commenced footing or drawing off the total amounts due each company. Mr. Wattson, at our Montreal meeting, stated that out of 30 roads settling on per diem basis he checked on seven roads a total of 1,043 errors during one month, an average of 149 errors per road, amounting to $700 in favor of his road. . . . While the individual movement report will not of itself prevent intentional errors in mileage it will detect unintentional errors and also show what mileage should be paid; it will then be easy to locate mileage that has not been reported. The information derived from these reports will familiarize us with the manner in which other roads treat our equipment. . . .

Our Foreign Commerce, the Largest in the History of the Country.

The Bureau of Statistics has issued a summary of our foreign commerce for a fiscal year ending with June 30, 1891, showing that the value of our commerce was $82,191,803 in excess of that of 1890, and $241,797,869 in excess of that of 1889. The total for last year was $1,729,330,896, of which the value of our exports was $884,425,405, and the value of our imports was $844,905,491, showing a balance of trade in our favor of $39,519,914 as against exports of $857,828,684 and imports of $789,310,409 in 1890.

The value of the leading articles of exports from the United States during the past year was as follows: Cotton, $290,708,898; breadstuffs, $127,668,092; provisions, $138,176,638. The value of the imports of merchandise admitted free of duty during the nine months ended June 30, 1891, was $295,963,665, while the value of such imports for the corresponding period of 1890 was $208,983,873, showing an increase in the imports of free merchandise during the nine months of $86,979,792. During the same period ended June 30, 1891, the imports of merchandise paying duty were of the value of $331,242,340, as compared with $389,786,032 for the corresponding period of 1890, so that it appears there has been a decrease during the last nine months of the fiscal year 1891 in the value of dutiable imports of $55,543,692.

"It will be seen, then," says the statement, "that during the nine months since the new tariff went into effect, of the total value of merchandise imported into this country 46.96 per cent. came in free, while during the corresponding period of 1890 34.92 per cent. was admitted free."

The balance of trade was pretty steadily against us from 1848 to 1875, both years inclusive. During that time there were only three years in which we had a favorable balance, aggregating only $28,863,142. Commencing with 1876, the balance of trade has been in our favor every year except 1888 and 1889, for which years there was an adverse balance of $30,732,844

There seems to be a mistake in the statement, quoted above, that last year shows the largest excess of exports of gold in any year of our commerce, as the "Statistical Abtract" lately issued by the Bureau of Statistics shows that our excess of gold coin and bullion exported in 1864 was $89,484,865, and the same year our silver exports were $2,796,064 in excess of our imports, although the total movement of bullion for that year was only $118,512,153, our total imports of gold and silver amounting to only $13,115,612 for that year.

TECHNICAL.

Manufacturing and Business.

The United Railway Car Heating Co. has just been organized at Boston with a capital of $500,000. It has purchased the steam car-heating and coupling inventions of James Emerson, of Willimansett, Mass., which are already in use on the Connecticut River and other roads. Horace H. Stevens is the President of the new company and C. H. Cole, Treasurer. The Directors are: N. J. Rust, O. J. Lewis, Oakes Ames, Horace H. Stevens, George H. Ball and John Mulligan. The latter is President of the Connecticut River road. Mr. Emerson turns over to the company about 20 patents. He has lately perfected an arrangement for using his system in connection with the Baker heater and pipes, and has also taken out a patent on an air-brake coupler designed to hang above the level of the platform of a car.

The firm of O'Brien & Clark, who had the largest contracts on the new Croton Aqueduct for New York City, has gone into the control of a receiver. The appointment was made on the application of John O'Brien, a member of the firm. John W. Hinckley was made general receiver. Mr. O'Brien has also begun a suit for the dissolution of the firm, which consists of Heman Clark, John O'Brien and John Mooney, the first two members representing about two thirds of the interest. It is claimed that Clark has overdrawn his account $100,000. The firm is in litigation with the city on a claim for over $4,000,000 for extra work on the aqueduct.

The Summit Railroad Equipment Co. has filed articles of incorporation at Trenton, N. J. The capital is $1,500,000 and the incorporators are Col. Archer N. Martin and Charles E. Kimball, of Summit, N. J.; E. W. Clark, E. E. Dennison, S. N. Cotton, Jr., and F. S. Kimball, of Philadelphia, and Henry A. V. Post and C. C. Pomeroy, of New York.

The South Texas Construction Co., of Galveston, Tex., has been chartered in Texas for the purpose of constructing railroads and railroad bridges.

The following companies have been incorporated in Illinois: The Consolidated Railway Equipment Co., by F. A. Sperry, Edwin Haynes and W. S. Kilmer, of Chicago, to manufacture railroad equipments; the Waukeegan Iron and Steel Co., with a capital stock of $50,000 (the iron and steel plant is to be built at Waukeegan, Ill.—the incorporators are E. L. Lamb, A. G. Clark and E. P. Upham); and the Coupler Construction Co., of Chicago, F. B. Lambert, E. E. Carroll and J. P. Collins, incorporators.

Iron and Steel.

The Totten & Hogg Iron & Steel Foundry Co., of Pittsburgh, has just received an order from Wm. Clark's Son & Co., of Pittsburgh, for eight roll housings and two pinion housings with bed. The firm recently completed the shipment of an 18 in. muck train to Harris Bros., Minneapolis, Minn., and will complete the shipment this week of two cars of steel roughing and chill rolls of different kinds for the Pacific Iron & Nail Co., San Francisco, Cal.

This week R. A. Carter, W. Y. Humphries and others, of Pittsburgh, will make application for a charter for the Monongahela Iron & Steel Co. for the manufacture of iron and steel and other metals.

The half-yearly statement of the Thomas Iron Co. shows that 78,000 tons of iron were made and 91,000 tons delivered, and the stock on hand was very small. The cost of making the iron was about $12.70 per ton during the greater part of the six months.

Probably the plant of the Columbia Iron & Steel Co. at Uniontown, Pa., will be put in operation during the present week. Labor claims amounting to $16,000 have just been paid off.

D. R. Lean, engineer and contractor, of Pittsburgh, Pa., has closed a contract with the North Carolina Steel & Iron Co., of Greensborough, N. C., for constructing a complete blast-furnace plant to be completed in about ten months from date of beginning work.

The plant of the Linden Steel Co., Ltd., at Pittsburgh, Pa., which has been closed down for three or four weeks while the annual repairs were being made, has again resumed operations. The firm has some large orders, among them the heavier plates made under contract for the government.

At a meeting of the stockholders of the Ashland Steel Co., now erecting a Bessemer steel plant at Ashland, Ky., held recently, the board of directors organized by electing I. A. Kelly President; John Russell, Vice-President; B. H. Burr, Secretary, and E. C. Means, Treasurer. Work on the plant, which is being erected by the Pittsburgh Iron & Steel Engineering Co., is progressing rapidly, and will be ready for operation by Oct. 1 it is expected.

The Duquesne Tube Works Co., of Pittsburgh, has just completed some extensive improvements to its wrought-iron plant at Duquesne, Pa. The firm has decided to increase its capital stock from $100,000 to $150,000, and may build a rolling mill. The firm has now under erection a large machine shop and a butt-welding department.

The Johnson Steel Rail Co., at Johnstown, Pa., has completed plans for a new machine shop and roll mill, 365 × 50 ft.

The Bristol Foundry & Machine Works has been organized at Bristol, Tenn. The capital stock is $25,000. Major A. D. Reynolds has been elected President, and James B. Lyon Secretary and Treasurer.

The Schoen Pressed Steel Brakebeam Co., whose incorporation was noticed last week, has been organized for the purpose of manufacturing an improved brakebeam made entirely of pressed steel. It does not succeed the Schoen Mfg. Co., of Pittsburgh, as stated. No change will be made in the business of the latter company, and it will still continue the manufacture of centre plates and other pressed-steel articles for use in railroad-car construction.

The Rail Market.

Steel Rails.—In the East the market is very dull and no sales have been made. In the West the feeling is more hopeful and a number of small orders have been placed. The quotations are $31.50@$33 at Chicago and $30 at Pittsburgh.

An Evening Class in Steam Engineering.

Announcement is made that the class in steam engineering carried on at the Young Men's Institute, 222, 224 Bowery, this city, will open on the evening of Wednesday, Sept. 30, 1891, and will continue its sessions Wednesday and Friday evenings of each week until April 27, 1892; seven months in all.

The class has for its object the instruction of all employed or expecting to be employed in the practical operation of engines, boilers and machinery, and desirous of gaining a knowledge of or improving themselves in the theoretical branches, rules and practice of steam-engine, boiler and power-transmission calculations. Special attention is given to all information not attainable in shop practice, and to such matters required by examining boards and particularly essential to the engineer, fireman, machinist, boilermaker and the like, in the proper performance of his daily duties. It is the only class of its kind in the city. The expenses are exceedingly moderate, amounting to between $10 and $11 for the whole seven-months course. A knowledge of the ordinary rules of arithmetic, including fractions and decimals, is all that is required to enter the class. The course at present covers two winter sessions, and certificates of advancement are given to those showing a good attendance and substantial progress during each session. To the one standing highest in his grade in both attendance and proficiency a special award is given.

Further information can be had by addressing the Secretary of the Institute, at 222 Bowery, or Mr. Wm. H. Weightman, Columbia Building, 29 Broadway, New York City.

Electrical Patent Decisions.

On July 23 Judge Cox, of the U. S. Circuit Court for the Southern District of New York, handed down his decision again sustaining the patents of Mr. C. F. Brush for "improvements in secondary batteries." About a year ago Judge Cox decided in favor of these patents in a case brought against the Julien Co. and now in this against the Electrical Accumulator Co. Of course the case will be carried up to the Circuit Court of Appeals, and it is probable that a final decision will be rendered before many months. When it is finally settled as to who is the owner of the fundamental patents and as to what they actually cover, we shall see more rapid improvement in the batteries. Increased commercial efficiency is the only road to a profitable business. For a long time the fear of legal complications has prevented many large investments in accumulator plants for various purposes, and undoubtedly the removal of this serious drawback will give new life to the company controlling the patents.

On July 14 Judge Wallace, in the United States Circuit Court, rendered a decision sustaining the Edison incandescent-lamp patents in the case of the Edison Electric Light Co. vs. The United States Electric Lighting Co. (Westinghouse). A stay in the injunction was granted for six months, during which time the case will be appealed to the Circuit Court of Appeals.

When the final decisions in these two cases are given two great steps will have been made in clearing the dense atmosphere surrounding all electric patents due to the immense number granted in the last 15 years, so many having conflicting claims. Every time that a patent is sustained it gives greater confidence and therefore adds to the value of all others.

The Contract for Cruiser No. 13.

Secretary Tracy has finally decided to award the contract for building cruiser No. 13 to the William Cramp & Sons' Co., of Philadelphia, although the Bath Iron Works, of Maine, were the lowest bidders. The Secretary says that the Bath Iron Works admit that they are wholly unable to build the engines of the ships, and do not propose to build them; that they would be unable to build the ship within the contract time, namely, two years, and finally that it would be too great a risk to give the building of the cruiser to a new and inexperienced firm which has never yet completed a ship. As the Messrs. Cramp have finally consented to reduce their bid to the figure named by the Bath Iron Works, the Secretary awards the contract for cruiser 13 to the William Cramp & Sons Engine & Shipbuilding Co., at $2,690,000.

Nickel-Steel Protective Plates.

The Secretary of the Navy has contracted with Carnegie, Phipps & Co. for ten 3-in. protective-deck nickel-steel plates, upper layers. The relative cost of these plates as compared with pure steel will be studied, and if satisfactory terms can be made this kind of armor will be adopted in the construction of the armored cruiser New York and for the protective deck of cruisers Nos. 12 and 13.

THE SCRAP HEAP.

Notes.

The Illinois Central is preparing to adopt the standard code of train rules.

The Cincinnati, New Orleans & Texas Pacific has discharged a considerable number of conductors. It is said that the total number of conductors discharged by the Illinois Central a few weeks ago was 40.

The locomotive engineers of the Missouri, Kansas & Texas after a long conference have secured a general advance in wages. Engineers on ten-wheel engines will get 4 cents per mile, local engineers 5 cents, passenger engineers 3½ and 4 cents, and switch engineers $3.65 per day.

A fire, supposed to be incendiary, was started in the Alabama Great Southern freight station at Birmingham, Ala., on the night of July 31, and 50 kegs of powder in the building were exploded. Thousands of windows were broken and the loss to the railroad and neighboring buildings was $28,000.

The Nebraska Legislature at its last session passed a law making eight hours a day's work, and providing that employés working more than that number of hours a day should be paid at higher rates for overtime. This law went into effect Aug. 1, and numerous large employers, including the Chicago, Burlington & Quincy Railroad, have issued notices to the effect that employés will be paid by the hour.

The instruction of trainmen in carrying out rules, especially those touching upon the proper interpretation of telegraphic train orders, has been made the subject, on the Philadelphia & Reading, of a series of lectures or catechizing exercises. A Philadelphia paper states that the trainmasters on all the divisions have instructions to hold these schools regularly. At Reading they are held on Sunday mornings from 9 to 12.

The Springfield Iron Co., of Springfield, Ill., has brought suit in replevin against the Carbon Iron Co., of Pittsburg, to prevent the removal of about $20,000 worth of steel ingots and plate now in the yards of the former company. The Carbon Iron Co. was operating the steel-plate mill of the Springfield company under lease, it being stipulated that the lessees should leave the property in as good shape as they found it. About two weeks ago the mill burned down, and now the Carbon Iron Co. refuses to rebuild, and is preparing to remove its property from the state.

J. O. Stakely and Dennis McCurdy, conductors on the Chicago & Eastern Illinois, who persuaded trainmen on that road to strike last November, have been convicted of conspiracy in Chicago and fined $100 each. These men did not belong to any brotherhood, but seem to have succeeded in doing a good deal of mischief in a short time by acting as self-appointed agitators. They first got a few men to abandon freight trains and then sent telegrams and letters to all points on the road. The employés, however, soon perceived the true situation and the strike lasted only four days.

New Stations and Shops.

Plans have been prepared for a union station to be built at Manchester, N. H., by the Boston & Maine and the Concord & Montreal roads. As soon as the officers agree upon the expenses to be borne by each road, and the consent of the town to the closing of one of the streets are obtained, the erection of the building will begin.

The Wabash, the Chicago & Eastern Illinois and the Peoria, Decatur & Evansville are to build a union station at Sullivan, Ill. The building will be of stone.

The Wabash has awarded to Z. Fielder the contract for building a freight house at Hannibal, Mo. It will be of brick, 230 ft. × 50 ft., with a two-story front for offices. It will cost about $20,000.

The Lake Shore & Michigan Southern is building a freighthouse at Jackson, Mich., similar to the one recently completed at Grand Rapids. It will cost about $12,000.

The Wheeling Bridge & Terminal Co. has prepared plans for a small roundhouse to be built in Wheeling, W. Va. It will be of brick, within the city limits, and similar to the one already built. It will have five stalls, each 70 ft. in length, 12½ ft. wide in front and 24 ft. wide in the rear.

The Northern Pacific is building a new passenger station at Olympia, Wash.

The Death of Betsey Cheeseman.

The snake editor of the New York *Sun*, who, apparently living on the verge of delirium, tells the largest snake stories found in any of our contemporaries, tells of the killing of a pet rattlesnake, named for its owner as above, by a pusher out of Susquehanna. After several stories of the dead snake's intelligence as a ratter and a retriever the narrative ends as follows:

"Charley Mygatt will be sorry to hear of Betsey's death, I'll bet," said Jerry Buckley, the engineer of the pusher, "for he declares that she saved him from killing a man once, just this side of the Summit. He was coming down the hill a-booming, when he saw a red flag fluttering from a switch-stand at one side of the track a hundred yards or so ahead of him. He clapped on the air brakes and brought the train up in short order. Then he discovered Betsey on the switch with a big red handkerchief in her mouth. Two or three hundred feet ahead, a quarryman with a jag on lay asleep right across the track. The red handkerchief belonged to him. The supposition was that Betsey had been strolling along that way, and, discovering the man on the track, had pulled his bandanna out of his pocket, hurried to the switch, climbed it, and swung out the danger signal."

Flowers on the Michigan Central.

Some of our readers will remember that we mentioned a few weeks ago the fact that Mr. Hawks, Chief Engineer Michigan Central, had put in practice the plan of distributing bouquets of flowers to the ladies traveling on that road. Of course this can only be done to a limited extent, but it is a graceful idea, and no doubt has had its effect in making the road popular. It is one of various ways in which refined taste and a touch of fancy have been made apparent on the Michigan Central, of late years, to the pleasure of thousands of travelers and to the ultimate profit of the road. A Detroit paper, with a mistaken idea of fun, made some rather coarse and dull comments on the matter, saying, among other things, that Mr. Hawks had been deluged with letters from women, of which "several contained point-blank proposals of marriage." Mr. Hawks' remarks on this performance of the newspaper are characteristic. He says:

"I presume the article in Sunday's *Free Press* about the practice of giving bunches of flowers to the women passengers of the Michigan Central is intended to be humorous, but I cannot see it in that light. If you will kindly give me the name of the writer, I will undertake to teach him that a love of flowers and the respect for women may have been inherited along with qualities capable of making him regret the uncalled for slander. I shall continue to put free flowers on our trains, although I have never received a letter from a woman, young or old, on the subject. The next time you want to get a joke on me I hope you will leave the women out."

What Was the Brake Power?

READING, Aug. 3.—Yesterday the largest single train ever hauled on the Philadelphia & Reading passed down the main line, having left Schuylkill Haven at 8:58 a. m. and arrived at Port Richmond at 8:05 p. m., the run consuming 11 hours. The train was over 3,000 ft. in length, and consisted of 90 cars of coal. The total gross weight of the train was 3,019 tons.—*Philadelphia Public Ledger.*

Northern Central Grain Elevators.

A large grain elevator of the Northern Central at Calvert Station, in Baltimore, is expected to receive its first grain this week. All the machinery has been placed in position and tested. The elevator at Lower Canton will be completed about the middle of the month.

A Highwayman in a Sleeping Car.

Mr. D. F. Connell, of Portsmouth, Ohio, was shot in his berth by a would-be murderer, on a sleeping car on the Chesapeake & Ohio Road near Basic City, on Saturday morning, August 1, but at last accounts he was likely to recover. There is considerable mystery about the affair. Some reports intimate that the assassin's object was to shoot Connell on account of some grudge. The young lady who occupied a berth adjoining Connell's says she heard the assassin's demand upon him for his money, and the discharge of the pistol followed immediately.

Railroads as Land Agents for Outside Parties.

The Louisville & Nashville has issued posters announcing that it will hereafter advertise and negotiate the sale of lands in the country tributary to its line, the purpose being to publish lists of purchasable lands, together with descriptons of the country, the soil and climate, possibilities and prospects, etc.

The Engines Struck Out for the East.

One of those annoying mistakes which occasionally occur in railroad offices took place a short time since at The Dalles, on the Union Pacific. Mr. Shearer had 48 carloads of wool which he wished to ship to Boston over the Northern Pacific. In the regular course the Union Pacific would haul the wool to Wallula Junction and turn the cars over to the Northern Pacific. This is an unusual thing, and led to a mistake which has caused some profanity. The wool was started for Wallula all right, but the engineers in charge of the trains, instead of going there, when they arrived at Umatilla turned off as usual on the Short Line and struck out for the East. Just how this mistake came about will probably never be known, but the Northern Pacific has lost the long haul on the wool. The Union Pacific officials decline to discuss the matter.—*Portland Oregonian.*

Bit off More than They Could Chew.

The excursion on the —— road was in four sections. The trains were several hours late, the delay being caused by an attempt to haul ten coaches, seven sleepers and a chair car, all well filled, with an ordinary passenger locomotive. The latter broke down and a mogul was sent 60 miles to the rescue. When this was attached it was able to pull the train, but four drawbars succumbed to the great strain and the train had finally to be cut in two. There were about two thousand excursionists in all.—*Western Paper.*

A New Railroad Across England.

A road is projected from the Mersey to the North Sea, commencing at Warrington on the Manchester ship canal and about 19 miles from its terminus at Eastham on the Mersey, crossing England in a line 150 miles long, and passing through Macclesfield, Edgemoor (where the maximum altitude of 1,175 ft. is reached), Chesterfield and Lincoln to Sutton-on-Sea, where harbors and docks are proposed which may rival Grimsby. The estimated cost is £41,000 per mile, of which £28,000 is allowed for land. A viaduct 1,629 ft. long and 270 ft. high, which will be the highest in the kingdom, will be required to carry the line over the Midland road at Monsal Dale, and in this same section of 14 miles long between Macclesfield and Chesterfield there will be over seven miles of tunnel.

LOCOMOTIVE BUILDING.

The Wabash is building six 10-wheel locomotives for its Western lines at its Toledo shops.

The Mexican road has just received four new freight locomotives from the works of Dubs & Co., of Glasgow, Scotland.

The Rhode Island Locomotive Works have been awarded a contract to build 10 locomotives for the Canadian Pacific.

CAR BUILDING.

Two handsome sleeping-cars have just been completed at the East Buffalo shops of the Wagner Palace Car Co. They are the first of an order for 30 now building. Six

of the sleeping-cars are for the Chicago-St. Paul limited trains of the Chicago & Northwestern, and the balance are for service between New York and Chicago. The cars are 70 ft. long, and are equipped with the vestibule patented by General Manager T. A. Bissell. The interiors of the cars are finished in San Domingo mahogany, richly carved. They are to be lighted by the Pintsch gas light, and have the Leland steam-heating system.

The Louisville & Nashville has put in service a new vestibule train, to run between New Orleans and Washington, which has just been completed by the Pullman company. In addition to sleeping-cars there will be dining, observation, library and parlor cars. They are to have steam heat and to be lighted by electricity.

The Wabash is building six chair cars at its shops at Toledo, O. The St. Charles Car Co. is delivering 250 box cars for the road.

The Texas & Pacific has recently let a contract for 500 cars to the St. Charles Car Co.

BRIDGE BUILDING.

Alderton, Wash.—The contract for the Alderton bridge across the Puyallup River, the first bids on which were rejected, was let last week to Grant & Billingsley. The bids were as follows: Oregon Bridge Co., $4,450; San Francisco Bridge Co., $3,998; Hoffman & Bates, $4,200, and Tween & Savage, $3,875, $3,850 and $3,900.

Buena Vista, Va.—The iron bridge to be erected over the Buffalo River on the Lexington and Natural Bridge road has been let to the Columbus Bridge Co. for $2,920.

Clarksville, Tenn.—The Keystone Bridge Co., of Pittsburgh, Pa., has the contract to build a new iron bridge across the Cumberland River near Clarksville, for the Louisville & Nashville, to replace the present structure.

Des Moines, Ia.—The ordinance for the construction of an iron highway bridge at the foot of West Ninth street has been referred by the City Council to the City Engineer and the board of Public Works to act with the council. Another ordinance is before the council to authorize the erection of a bridge at the west end of Locust street.

Elizabeth, Pa.—It is stated that the Pennsylvania company will build a bridge over the Monongahela River at Elizabeth for vehicle and foot travel.

Farmington, Me.—The contract for a steel bridge over the Sandy River at Farmington has been awarded to the Pittsburgh Bridge Co., for $12,850. The bridge is to be of three spans, about 125 ft. long, with one roadway 20 ft. and sidewalk 15 ft.

Gilmer County, W. Va.—A commission has been appointed by the County Court to receive proposals and let the contract for a new bridge over Cove Creek near its mouth. The commission favors a steel bridge, and the span will be over 200 ft. long.

Inavale, Neb.—The contract for building an iron bridge across the Republican River, at Inavale, has been awarded to the Chicago Bridge Co., by the Board of Public Supervisors. The cost is not to exceed $70,000.

Indianapolis, Ind.—The County Commissioners have approved of the site of the proposed bridge on Grand View avenue near First street, in Indianapolis.

Keokuk, Ia.—It is proposed to build a high bridge across the Mississippi River at Keokuk under a charter recently granted. The city will probably pay part of the expense of constructing the bridge.

Knoxville, Tenn.—The following proposals for the erection of the Gay street steel girder bridge were opened July 27: Wisconsin Bridge Co., $47,200; Smith Bridge Co., $42,135; Pittsburgh Bridge Co., $49,000; Youngstown Bridge Co., $40,850; Indiana Bridge Co., $47,000; Chicago Bridge Co., $41,000; Shiffler Bridge Co., $41,000; King Iron Bridge Mfg. Co., $39,300; Penn Bridge Co., $43,000; Champion Bridge Co., $47,750; Massillon Bridge Co., $41,895.

Long Island City, N. Y.—The Long Island Railroad has agreed to erect an iron bridge over Stillman avenue, Long Island City, at a cost of about $10,000.

Napa, Cal.—The plans of the proposed Third street bridge have been prepared by Raymond & Bay, of San Francisco. The estimated cost is $27,000.

Norristown, Pa.—The Philadelphia & Reading proposes to soon commence the construction of a new iron bridge across the Schuylkill River at Norristown, so that trains can cross from the main line and run over the Philadelphia, Germantown & Norristown branch into Philadelphia.

Ottawa, Ont.—The bills incorporating the Ontario & New York Bridge Co. and the Buffalo & Fort Erie Bridge Co., which recently passed the Dominion Parliament, have become laws.

Pennington, N. J.—The Board of Freeholders of Mercer County has ordered the erection of a bridge over the Pennington creek near the station.

Philadelphia.—The Bureau of Surveys has the plan for the superstructure of the Walnut street bridge nearly ready and proposals will soon be advertised for. The work on the piers is progressing. The east river pier is completed and the west river pier and abutment is completed to the high-water line. Much of the work on the approaches is also completed.

San Francisco, Cal.—The proposition of the San Francisco & San Mateo Railway Co. for the construction of an iron bridge to replace the wooden structure across Second street has been accepted. The expense of building the new bridge will be $12,750.

Susquehanna, Pa.—A new bridge is to be erected over Canawacta Creek at Lanesboro, on the line of the New York, Lake Erie & Western one mile east of Susquehanna. The present bridge is an iron double-deck structure 464 ft. long, having four spans, each 116 ft. long. It was built in 1873.

Towson, Md.—The commissioners of Baltimore County have awarded the contracts for building two iron bridges, one over Brice's Run and the second over Piney Road, to the Wrought Iron Bridge Co., of Canton, O. The first bridge is to cost $710 and the second $686.

Vernon, Tex.—The Fort Worth & Denver City Railroad is building an iron bridge over the Pease River near Vernon to replace a bridge recently washed away.

Wampun, Pa.—The Pittsburgh & Lake Erie has begun the erection of a new bridge across the Beaver River above Wampun. It will be double track and about 200 ft. farther up the river than the present crossing.

Washington, D. C.—Captain Rossell, who is in charge of the proposed bridge across the eastern branch of the Potomac River near Bennings, has examined a number of designs and plans for the structure. It is stated that the plan which will be adopted provides for 20-ft. spans resting upon iron pillars sunk to solid ground, with a roadway 24 ft. wide and two foot walks each 5¼ ft. wide. The appropriation for the bridge by Congress is $60,000.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago & Alton, quarterly, 2 per cent., payable Sept. 1.

Chicago, Burlington & Quincy, quarterly, 1 per cent., payable Sept. 15.

Flint & Pere Marquette, 1½ per cent., on the preferred stock, payable Aug. 15.

New York, Providence & Boston, 2½ per cent., payable Aug. 10.

St. Paul & Duluth, 3¼ per cent., payable Sept. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Atlanta & Florida, annual, Atlanta, Ga., Aug. 11.

Boston, Hoosac Tunnel & Western, annual, Saratoga Springs, N. Y., Aug. 19.

Chicago, Milwaukee & St. Paul, annual, Milwaukee, Wis., Sept. 16.

Detroit & St. Clair River, special, St. Clair, Mich., Sept. 15, to increase capital stock.

Hutchinson & Southern, special, Hutchinson, Kan., Aug. 25.

Marietta & North Georgia, annual, Marietta, Ga., Aug. 20.

New York, Ontario & Western, annual, New York City, Sept. 30.

Richmond & Chesapeake, annual, No. 1014 Main street, Richmond, Va., Aug. 13.

Wabash, annual, general offices at St. Louis, Mo., Sept. 8.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *New England Roadmasters' Association* will hold its ninth annual meeting at Boston, Mass., Aug. 19 and 20.

The Roadmasters' Association of America will hold its next annual convention at the West Hotel, Minneapolis, Minn., Sept. 8, 9 and 10.

The *New England Railroad Club* meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August.

The *Western Railway Club* holds regular meetings on the third Tuesday in each month, except June, July and August, at the rooms of the Central Traffic Association in the Rookery Building, Chicago, at 2 p. m.

The *New York Railroad Club* will hold its next meeting at its rooms, in the Gilsey House, New York City, at 2 p. m., on the third Thursday in September.

The *Southern Railway Club* holds regular meetings on the third Thursday of the months of January, February, March, May, September and November at such points as are selected at each meeting.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, the fourth Wednesday of January, March, May, September and November.

The *Northwest Railroad Club* meets on the first Saturday of each month, except June, July and August, in the St. Paul Union Station, at 7:30 p. m.

The *Northwestern Track and Bridge Association* meets on the Friday following the second Wednesday of each month at 7:30 p. m. in the directors' room of the St. Paul Union Station, except in the months of July and August.

The *American Society of Civil Engineers* holds its regular meetings on the first and third Wednesday in each month, at the House of the Society, 127 East Twenty-third street New York

The *Boston Society of Civil Engineers* holds its regular meetings at the American House, Boston, at 7:30 p. m. on the third Wednesday in each month.

The *Western Society of Engineers* holds its regular meetings at 78 La Salle street, Chicago, at 8 p. m., on the first Wednesday in each month.

The *Engineers' Club of St. Louis* holds regular meetings in the club's room, Laclede Building, corner Fourth and Olive streets, St. Louis, on the first and third Wednesdays in each month.

The *Engineers' Club of Philadelphia* holds regular meetings at the House of the Club, 1,122 Girard street, Philadelphia, on the first and third Saturday of each month, excepting in January, when the annual meeting is held on the second Saturday of the month. The second January meeting is held on the third Saturday. The club stands adjourned during the months of July, August and September.

The *Engineers' Society of Western Pennsylvania* hold regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Thaw Mansion, Fifth street, Pittsburgh, Pa.

The *Engineers' Club of Cincinnati* holds its regular meetings at 8 p. m. on the third Thursday of each month in the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati.

The *Civil Engineers' Club of Cleveland* holds regular meetings on the second Tuesday of each month, at 8 p. m., in the Case Library Building, Cleveland. Semi-monthly meetings are held on the fourth Tuesday of the month.

The *Engineers' Club of Kansas City* meets in Room 200, Baird Building, Kansas City, Mo., on the second Monday in each month.

The *Engineering Association of the South* holds its monthly meetings on the second Thursdays at 8 p. m. The Association headquarters are at Nos. 63 and 64 Baxter Court, Nashville, Tenn.

The *Denver Society of Civil Engineers and Architects* holds regular meetings at 36 Jacobson Block, Denver, on the second and fourth Tuesday of each month, at 8 o'clock p. m., except during June, July and August, when they are held on the second Tuesday only.

The *Civil Engineers' Society of St. Paul* meets at St. Paul, Minn., on the first Monday in each month.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.

The *Civil Engineers' Association of Kansas* hold regular meetings at Wichita on the second Wednesday of each month at 7:30 p. m.

The *American Society of Swedish Engineers* holds meetings at the club house, 250 Union street, Brooklyn, N. Y., and at 347 North Ninth street, Philadelphia, on the first Saturday of erch month.

The *Engineers' Club of Minneapolis* meets the first Thursday of each month in the Public Library Building, Minneapolis, Minn.

The *Canadian Society of Civil Engineers* holds regular meetings at iss rooms, 112 Mansfield street, Montreal, P. Que., every alternate Thursday except during the months of June, July, August and September.

The *Association of Civil Engineers' of Dallas* meets at 803 Commerce street, Dallas, Tex., on the first Friday of each month at 4 o'clock p. m.

The *Montana Society of Civil Engineers* meets at Helena, Mont., at 7:30 p. m., on the third Saturday in eacu month.

The *Civil Engineers' Association of Kansas* holds regular meetings at Wichita on the second Wednesday of each month, at 7:30 p.

The *American Society of Swedish Engineers* holds meetings at the club house, 250 Union street, Brooklyn, N. Y., and at 347 North Ninth street, Philadelphia, on the first Saturday of each month.

The *Engineers' Club of Minneapolis* meets the first Thursday of each month in the Public Library Building, Minneapolis, Minn.

The *Canadian Society of Civil Engineers* holds regular meetings at its rooms, 112 Mansfield street, Montreal, P. Que., every alternate Thursday except during the months of June, July, August and September.

The *Technical Society of the Pacific Coast* holds regular meetings at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., at 8 p. m. on the first Friday of each month.

Master Car & Locomotive Painters' Association.

The twenty-second annual convention of the Association will be held in Washington, D. C., opening on Wednesday, Sept. 9, to continue in session for three days.

The Arlington Hotel has been selected as the headquarters of the Association. The rates for board will be $3 and $4 per day.

The following programme has been prepared. Delegates are asked to be prepared to discuss each question as presented, after the committees have reported:

(1) Is there a chemically pure soap that can be safely used for cleaning the outside varnished surface of passenger cars while in service? Stating soap, results and method of cleaning. W. O. Quest, Pittsburgh & Lake Erie, Pittsburgh, Pa.; T. Bryne, Chesapeake & Ohio, Richmond, Va.; J. H. Speer, Western Railway of Alabama, Montgomery, Ala., Committee.

(2) As a question of economy and durability, should rough stuff be discarded on the outside surface of a passenger car? If so, what materials and methods of application will best answer the requirements of this class of work, durability being the main consideration? W. T. Hogan, Atchison, Topeka & Santa Fe, Topeka, Kan.; A. R. Given, West Shore, Frankfort, N. Y.; A. J. Bishop, Cleveland, Cincinnati, Chicago & St. Louis, Delaware, Committee.

(3) Can a new locomotive receive a durable finish in 10 days? Stating methods and materials used. A. J. Moriarty, Baltimore & Ohio, Newark, O.; A. S. Coleman, Intercolonial (Canada), Moncton, N. B.; J. H. Long, Chicago, Burlington & Quincy, Aurora, Ill., committee.

(4) The cleaning of varnished surfaces of coaches, locomotives and other outside work while in service, material used, modes of application, etc., by J. K. Lowry, Chicago, Burlington & Northern, La Crosse, Wis. (5) As an associated body can we exert an influence on purchasing power that would remedy, where necessary, the quality of materials furnished? J. A. Gohen, Chesapeake & Ohio, Huntington, W. Va.; R. McKeon, New York, Lake Erie & Western, Kent, O.; A. T. Schroeder, Chicago, Milwaukee & St. Paul, Milwaukee, Wis., committee.

(6) How should the new wood head-lining material of a passenger car be treated to prevent the finished surface from becoming destroyed, from decay of filler, grain raising, etc., due to the interior heat and moisture of a passenger car? J. T. McCracken, Delaware Car Works, Wilmington, Del.; Edward Webb, Laconia Car Works, Laconia, N. H.; A. Campbell, Manhattan Elevated, New York, committee.

(7) Are railroad companies benefited through the Association of Master Car and Locomotive Painters? by Samuel Brown, Old Colony, Boston, Mass.

(8) Reports of committee of twelve appointed on geographical interchange of test panels, painted and exposed for a period of ten months in the extreme different climatic sections of the country.

TOPICAL QUESTIONS.

1. Would it be advisable to form a bureau of information in connection with our Association? 2. Do you use all or part shellac on the hard-wood inside finish of passenger cars? 3. How do you prepare stack blacking for locomotives while in service? 4. What materials do you use and how long do you take to paint freight cars? 5. As an item of shop economy, in what manner can you keep paint stock and brushes in the most serviceable state? 6. What is the best formula for preparing floor paint for passenger cars? 7. What are your views concerning the piecework system for the railroad paint shop? Robert McKeon, Kent, O., is Secretary.

PERSONAL.

—Mr. Austin Corbin, President of the Long Island road, is to be elected a director of the New York & New England.

—Mr. J. Luther Ringwalt, of Philadelphia, a well-known newspaper man, and for the last 16 years the editor of the *Railway World*, died at Downington, Pa., July 29, in his 63d year.

—Mr. J. R. Taylor, formerly Auditor and later Manager of the Rome & Decatur road, now operated by the East Tennessee, Virginia & Georgia, died at Opelika, Ala., July 30. He was 25 years of age.

—Mr. W. O. Smith, Master Car Builder of the Lake Shore & Michigan Southern shops, at Norwalk, O., has resigned to accept a position in the mechanical department of the Wheeling & Lake Erie, at Toledo, O.

—Mr. Louis Eckstein, General Passenger Agent of the Wisconsin Central, has resigned his position, to take

effect Sept. 1. He will be succeeded by Mr. James C. Pond, Assistant General Ticket Agent of the Northern Pacific.

—Mr. G. L. Sands, formerly General Superintendent of the western lines of the Atchison, Topeka & Santa Fe, has been appointed General Master of Transportation of the San Antonio & Aransas Pass road. Mr. F. A. Lister, Superintendent of Transportation of the road, resigned last week.

—Mr. E. J. Cuyler, formerly Division Superintendent of the Chicago & Northwestern, is seriously ill in Chicago. When he resigned, two months ago, he left the city for his health, but he has just returned from Winnipeg in a critical condition. He is said to be suffering from cancer.

—Mr. Robert B. Campbell was appointed last week General Superintendent of the trans-Ohio lines of the Baltimore & Ohio, succeeding Mr. Edward Dickinson, who resigned to become Assistant General Manager of the Union Pacific. Mr. Campbell is now about 40 years of age, and has been Assistant Division Superintendent of the Central Pacific and Division Superintendent of the Chicago, Milwaukee & St. Paul from 1882 until recently. He began as a telegraph operator when 15 years old.

—Mr. Samuel Garwood, late Managing Director of the Atlantic City road, has been elected Vice-President and Assistant General Manager of the American Steel Wheel Co., vice Mr. George H. Burt, of Boston, resigned. Mr. Garwood has been for many years connected with the management of the New Jersey lines of the Philadelphia & Reading. In his new position he will have immediate charge of the steel works at South Boston and of the New England business generally, with headquarters in Boston.

—Mr. Richard Smith, formerly a large railroad contractor, died at his home at Troy Hills, N. J., July 31, aged 58 years. Mr. Smith was by profession a civil engineer, and during his business life secured many large railroad contracts. He built part of the New York, Chicago & St. Louis, and also had a large contract on the Chicago & Atlantic. He was the promotor of the Cincinnati, Van Wert & Michigan, and Treasurer of the road until its reorganization.

—Mr. George A. Keefer, of Victoria, B. C., sailed on the Canadian Pacific steamship "Empress of India" from Vancouver, July 29, for Yokohama. It is understood that Mr. Keefer will proceed directly to Vladivostock and examine the route of the government railroad through eastern Siberia from that point. Mr. Keefer is to make a report of his examination to a Canadian company which has been asked to tender for the construction of about 300 miles of the eastern part of the road between Vladivostock and the Amur River.

—Mrs. Hopkins-Searles, who died at Methuen, Mass., last week, was well known as the widow of Mark Hopkins, of California, who was one of the three "magnates" who built the Central Pacific. She held many millions of dollars of the stocks and bonds of the Southern Pacific Company and its controlled lines, and it is reported that she has left the whole to her surviving husband, Searles, disinheriting her adopted son, Timothy Hopkins, the present Treasurer of the Southern Pacific Co. There have been rumors that possible changes in the ownership of this large amount of securities would result in changing the control of the Southern Pacific Company, but those directors of the company who have been Mrs. Searles' legal advisers say that they will continue to act in harmony with President Huntington.

—Jean Meyer, Chief Engineer of the Jura-Simplon Railroad, in Switzerland, died on June 29, at the age of 51 years. Mr. Meyer took a prominent part as expert in the St. Gothard tunnel masonry controversy, having made an examination of the work in 1883 in conjunction with the engineers Bechtle and Stockalper. On this occasion he narrowly escaped death from suffocation from tunnel gases, and never after fully regained health. As a writer on technical subjects he enjoyed a wide reputation, one of his most prominent contributions in this line being on the design and building of the Simplon tunnel. To the promotion of this important enterprise he devoted many years of his life, and it was one of his most sincere wishes to be able to be identified with the completion of this work, of which, unfortunately, he was not to witness even the beginning. He was an active contributor to the technical journals of the Continent. His chief work as an engineer was the development of the railroad system of western Switzerland.

ELECTIONS AND APPOINTMENTS.

Akron & Chicago Junction.—J. T. Johnson, at present (Ohio), General Superintendent of the Valley Railroad, has also been appointed General Superintendent of this road, soon to be opened for operation. Both lines are controlled by the Baltimore & Ohio.

Bristol Belt Line.—The officers of this company are as follows: A. H. Leftwich, President, Spartanburg, S. C.; J. L. Stadelman, Vice-President, Ardmore, Pa.; W. A. Stadelman, Treasurer and General Manager, Philadelphia, Pa.; S. L. Nicholson, Superintendent, Bristol, Tenn.

Canada Atlantic.—M. Donaldson, previously Superintendent of Transportation and Master Mechanic, has been appointed Superintendent of this company, with office at Ottawa. The office of Superintendent of Transportation has been abolished.

Central of Georgia.—The following appointments have been made on the Southwestern Division: T. S. Moise, formerly Superintendent of the Savannah & Atlantic Division, to be Trainmaster, with jurisdiction from Macon to Albany, Albany to Columbia, Smithville to Montgomery, Eufaula to Ozark, Cuthbert to Fort Gaines, Fort Valley to Perry, with office at Macon, Ga.; J. C. McKenzie, formerly Superintendent of the Southwestern Division, to be Trainmaster, with jurisdiction from Fort Valley to Columbus, Columbus to Troy and Troy extension, Columbus to Americus and Columbus to Greenville, with office at Columbus, Ga. The following appointments of trainmasters have been made on the main steam division: E. E. Anderson, office at Macon, Ga.; W. J. McKee, office at Savannah, and J. C. McMasters, office at Cedartown, Ga. C. E. Marvin has been appointed Roadmaster, with office at Savannah, and A. L. Wilkinson, Agent at Savannah in charge of terminals.

Chicago, Milwaukee & St. Paul.—J. F. Gibson, Assistant Superintendent of the Iowa and Dakota Division, has been appointed Superintendent of the Northern Division.

Cincinnati, Wabash & Michigan.—W. G. Bayley has been appointed Engineer Maintenance of Way, with headquarters at Wabash, Ind., with charge of all maintenance work, bridges and buildings.

Columbia River & Astoria.—B. Van Duzen, B. Young, E. A. Seeley, D. K. Warren and W. C. Smith, Astoria, Wash., are the incorporators of the company.

Dutchess County.—The following are the present officers of this company: George A. Fletcher, President, Philadelphia, Pa.; David J. McNiece, Secretary and Treasurer, No. 35 Broadway, New York City, and J. C. Patterson, Chief Engineer, Poughkeepsie, N. Y.

Fort Scott Central.—The following are named as Directors in the charter filed in Kansas last week: George J. Gould, New York; S. H. H. Clark, George C. Smith, St. Louis, Mo.; J. H. Richards, Fort Scott, Kan.; W. A. Johnson, Garnett, Kan., and Russell Harding, Wichita, Kan.

Georgia Pacific.—The jurisdiction of J. A. Davenport Engineer of Maintenance of Way, and W. H. Owen, Master Mechanic of the Georgia Pacific Division, has been extended over the Columbus & Western road. Mr. Davenport's jurisdiction has also been extended from Birmingham to Columbus, Miss., on the Georgia Pacific division.

Housatonic.—H. W. Snow has been appointed Auditor, with office at Bridgeport, Conn., vice A. C. Heltman, resigned.

Kansas City, Springdale & Clarksville.—The following is a complete list of the names and addresses of the incorporators of the company: R. B. Schneider, Fremont, Neb.; C. W. Schneider, Burtonville, Ark.; Ray Nye, Fremont, Neb.; Virgil R. Parter, Plattsburg, Mo.; P. D. Watson, Cameron, Mo.; L. H. McGill, Jno. Smart, H. L. Cross, C. M. Robinson and W. H. Cloe, Burtonville, Ark.

Knoxville, Cumberland Gap & Louisville.—H. F. Pollock, of London, Eng., has been elected Vice-President of this company.

Lake Chelan Railroad & Navigation Co.—The officers of this new Washington company are as follows: Robert Law, President, Chicago, Ill.; L. H. Woodin, Vice-President, Chelan, Wash.; Andrew Haas, Treasurer, Omaha, Neb.; A. F. Nichols, General Superintendent, Chelan, Wash.; Edgar Allen, Auditor, Omaha, Neb.

Louisville, New Albany & Chicago.—S. J. Collins, for several years Superintendent of the Milwaukee & Prairie du Chien Division of the Chicago, Milwaukee & St. Paul, has been appointed General Superintendent of this road, with headquarters at Chicago. The appointment will take effect Aug. 20, 1891.

Macon & Northern.—The Richmond & Danville, which recently leased this road, took formal control last week, and the authority of the general officers was extended over the road. John W. Hall, Treasurer of the Richmond & Danville, was appointed Secretary and Treasurer to succeed A. C. Palmer. C. P. Hammond was appointed Superintendent to succeed Hamilton Wilkins, and M. C. Figg has been appointed Auditor to succeed C. V. Palmer.

Monterey & Mexican Gulf.—Samuel Bingaman has been appointed Comptroller of this company, with office at No. 40 Wall Street, New York. R. H. Vaughan has been appointed General Eastern Agent, with office at New York City.

Northern Pacific.—The Yellowstone Division has been extended to embrace the territory between Billings and Livingston, Mont., including the Rocky Fork & Cooke City road. The office of Assistant Superintendent of the Montana Division has been abolished. J. M. Graham having resigned, the office of Assistant General Superintendent Eastern Division has been abolished. Division superintendents east of Livingston report to the General Superintendent.

F. J. Tourtelot has been appointed Superintendent of Dining Cars in place of J. J. Strong, who has resigned to engage in other business.

Ohio Valley.—The Chesapeake, Ohio & Southern on Aug. 1 began operating the Ohio Valley, with the following officials: M. B. Cutter, General Superintendent, vice James Montgomery, resigned; A. T. Sabin, Superintendent of Roadway, Bridges and Buildings; J. W. Luttrell, Superintendent of Motive Power; B. F. Mitchell, General Freight Agent, vice G. A. Smith, resigned; W. H. Prouty, General Passenger Agent, vice G. A. Smith, resigned; William Quarrier, Storekeeper, vice R. E. Fleming, Purchasing Agent, resigned, and W. E. Morse, Assistant Superintendent, with headquarters at Paducah, Ky.

Pullman Palace Car Co.—J. M. Smith, District Superintendent of the Eastern Division, has been transferred from Chicago to Denver, vice G. A. Randall, resigned; M. E. DuBois, District Superintendent of the Central Division, Chicago, succeeds Mr. Smith, and W. H. Batterson succeeds Mr. DuBois.

San Antonio & Aransas Pass.—George L. Sands has been made General Master of Transportation, with headquarters at Yoakum, Tex., vice F. A. Lister, Superintendent of Transportation, resigned.

Savannah, Americus & Montgomery.—W. J. Matthews has been appointed Superintendent of Transportation, with office at Americus, Ga. W. N. Marshall having resigned, the office of superintendent has been abolished.

Texas & Pacific.—W. J. Taylor has been appointed General Stock Claim Agent of this company, vice C. E. Henry, resigned. Mr. Taylor has been General Baggage Agent.

Wheeling Bridge & Terminal Railway Co.—James E. Taussig has been appointed Agent of the company, to succeed J. M. Belleville, resigned.

RAILROAD CONSTRUCTION,
Incorporations, Surveys, Etc.

Beech Creek.—Another report in reference to the proposed extension of this line has been printed this week. It is to the effect that a contract has been let for a line to extend from Kerrmoor, Clearfield County, near the terminus of the line, south to Patton in Cambria County, paralleling for part of the distance the new line of the Pennsylvania, the Cambria & Clearfield, now building.

Blue Mountain Mineral.—This road will soon be placed in operation. At present it extends from Jacksonville, Ala., north to a connection with the east and west of Alabama, a distance of four miles. The line was completed last week.

Bristol.—The contract for tracklaying on this short Vermont road will be awarded shortly. It is expected to have the line in operation in the fall. It has been graded for a distance of about 6½ miles from Bristol, Vt., west through Addison County to New Haven station, where it connects with the Central Vermont.

Caldwell.—The first regular train was run over this line this week. The new road is 4½ miles long and extends from the New York & Greenwood Lake road at Great Notch, south to Caldwell, with stations at Overbrook and Verona. An attempt has been made to get the Erie railroad to operate the road, but no terms have yet been made. It is rumored that the Delaware, Lackawanna & Western has threatened the Erie with competition in the valley above Montclair if it operates the Caldwell road.

Calgary & Edmonton.—The track was laid into Edmonton, Alberta, July 25. Regular trains will probably be running between Calgary and Edmonton, Aug. 17, if the present plans are carried out. The line is 190 miles long, and 100 miles of the grading and tracklaying have been done this year. The line will be transferred to the Canadian Pacific early in August. On the section south of Calgary, toward Fort McLeod, the grading has begun, and is at present in progress between Calgary and near Fish Creek. Mann Bros. have a sub-contract on this line, and also Messrs. Madigan, Sholtz, Clinnie, Laidlaw and Corlin & Lake. The grading will soon be in progress as far as Sheep Creek. The firm of Ross, Mann & Holt is the principal contractor.

California & Nevada.—The grading on the extension from Orinda Park, near Oakland, Cal., has been completed to Maple Grove, within six miles of Walnut Creek. Only a small force is working between the terminus and Walnut Creek. This is made necessary through the failure to secure the right of way. Little further trouble is anticipated from this source. The extension is standard gauge, and probably before it is opened for traffic the main line will be changed from narrow to standard. About 20 miles of the road is now operated.

Cape Fear & Cincinnati.—The company has filed in various counties in South Carolina a mortgage for $9,000,000 on the projected road between Norfolk and Charleston. The officers state that work will soon begin between Southport and Conway, S. C. Between Norfolk and Southport a line is already built.

Central of New Jersey.—Most of the right of way through Monmouth County, N. J., along the Shrewsbury River and at Navesink Highlands and Atlantic Highlands, N. J., for the new terminus of the Sandy Hook Division has been secured or promised to the company. The track on the United States government land on the Sandy Hook peninsula is to be taken up in the fall, and the terminus will then be at Atlantic Highlands. A bridge will be built across the Shrewsbury River at the Highlands of the Navesink.

Chicago & West Michigan.—Track laying was begun on the Charlevoix extension July 28. The work has been commenced at Traverse City, the southern terminus, and the track is now laid beyond the Boardman River, across which a 40 ft. bridge has been built. It is expected to lay the track to Elk Rapids by September.

Chipola & Chippewa Lake.—The organization of this company has been previously referred to. A charter for the line has been passed by the state legislature, which gives the company a land grant of 10,000 acres of land for each mile of road. The main line is to extend from Marianna to the Alabama state line, with branches to Chippewa Lake and St. Andrew's Bay. The officers are E. T. C. Dickenson, of Greenwood, Fla., President; J. T. Davis, Columbia, Ala., Vice-President, and W. H. Milton, Jr., Secretary. The capital stock is $1,000,000.

Columbia River & Astoria.—The charter for this company, recently filed in Oregon, is for a line from Astoria, Clatsop County, in a southwesterly direction to Portland. But, as stated last week, it is not intended to build at present beyond the Columbia River, at Goble Point, the road being projected mainly to complete a line between Astoria and the Northern Pacific, which crosses the Columbia River near Goble. The project includes steamer lines on the Columbia River and Willamette River. The capital stock is $1,500,000. The Astoria Improvement & Construction Co. has been incorporated by J. H. Smith and W. C. Smith, of Portland; Benjamin Young, of Astoria, and others, to construct the road.

Columbia River Railway & Navigation Co.—The company has asked the citizens of Portland, Or., to subscribe for $500,000 of its six per cent. 40-year bonds, to aid it in the construction of a portage railroad at The Dalles, on the north side of the Columbia River, which has been begun by the State of Oregon. If the bonds are subscribed the road is to be completed in eight months around the obstructions in the river at The Dalles and Cecilo, connecting navigable parts of the river. Steamers are to be put on the Snake and Columbia rivers. The project has been fully described in a previous issue.

Duluth & Winnipeg.—Tracklaying was begun July 25 above Grand Rapids, Minn., on the extension from that point across White Oak Point reservation, five or six miles. The contractors have recently hired a large number of men to be employed on the work near Grand Rapids.

Dutchess County.—The grading has been recently resumed on this line south of Poughkeepsie, N. Y., and the contractor has now about 250 men at work on the uncompleted portion of the line. About seven miles of the grading had been finished when the work was suspended last fall. No track has been laid, but the rails have been ordered, and it is expected to begin the tracklaying about Aug. 15. The maximum grade is 52.8 ft. per mile and the maximum curvature is five degrees. There are only two small iron bridges, one with two spans of 70 and 40 ft., respectively, and the other of one span of 40 ft. The road has been entirely surveyed and located, with the exception of the entrance into the city of Poughkeepsie, which will be finally decided upon within a few days. The contract for the building of the road has been let to J. C. Stanton, of No. 35 Broadway, New York City, and the grading has been sublet by him to T. T. Amory & Co., of Poughkeepsie, N. Y., Mr. Stanton looking after the superstructure himself. The road extends from a connection with the Poughkeepsie Bridge, at Poughkeepsie, in a generally southeasterly direction, through the towns of Manchester and Fishkill Plains, terminating at a connection with the New York & New England and Newburg, Dutchess & Connecticut roads at Hopewell Junc-

tion, a total length of 12 miles. The bonds of the road have been subscribed for, and the money received has been deposited with a trustee and is paid to the contractor as the work progresses.

Findlay, Fort Wayne & Western.—The company has been enabled to resume the grading on the extension west of Ottawa, O., to Fort Wayne, Ind., through the recent settlement of a right-of-way suit of an obstinate property owner. The track is being laid west toward Fort Wayne from a point eight miles west of Ottawa. The track is first to be laid to the crossing of the Toledo, St. Louis & Kansas City. The work may be again delayed at that point. The matter is not yet decided. The distance from Ottawa to Fort Wayne is 56 miles.

Florida, Georgia & Western.—The road is now graded west from Tallahasse, Fla., for about 18 miles to the St. Mark's River. A large force is working east of the river toward Fort Fanning, where the Georgia Southern & Florida is crossed. From that point the road will be extended south to Albion on the Florida Central & Peninsular.

Georgia Roads.—The following companies have bills pending in the state legislature for incorporation: The Atlantic, Americus & Florida; the Washington & Middleton; Nacoochee Valley; Savannah & Oconee, and the Savannah & Duvall.

Grayling, Twin Lakes & Northeastern.—This company filed a charter in Michigan last week. The capital stock is $240,000. The principal office is to be at Grayling, Mich.

Little Wabash.—The right of way having been secured from Effingham, Ill., south through Effingham County, it is announced that the grading will begin this season. The right of way north of Carmi has been secured for some time. The road is to extend from Carmi, Ill., northwest to Clay City, on the Ohio & Mississippi, about 30 miles, and thence to Effingham, a total distance of 60 miles.

Mexican Central.—The following report of the progress of the harbor improvements at Tampico, Mex., is made by Resident Engineer Wrotnowski for the Tampico Harbor Co.: "The north jetty is now 5,835 ft. long and south jetty 5,340 ft. When 7,000 ft. long the jetties will be in 24 ft. of water, which will be reached by October next. The distance between the two jetties is 1,000 ft. The bar is of sand and mud. The river when in flood has a discharge of 225,000 cu. ft. second. This enormous flood of water will quickly deepen the bar to about 25 ft. when the jetty works are completed. Work was commenced on June 1, 1890. Since that time 1,400 ft. of beach has been gained on each side of the jetties, and from 1,000 to 1,400 hands are now engaged in the work. About 700 cu. yds. of stone are dumped daily. An inexhaustible supply of stone is had about 61 miles from Tampico, in the State of San Luis Potosi. The piles are brought to Tampico from Pensacola and Pascagoula, Fla. The mattresses of brush are from 70 to 85 ft. at the bottom and about 30 ft. at the top. The average current of the river is five miles per hour. The Panuco River has a depth of 25 ft. a distance of about 80 miles inland to the town of Tamos. It is calculated by the engineers that vessels of the largest draught may enter in the fall.

Locating surveys are about to be commenced for the branch between Tula and Pachuca, Mex., which, according to previous surveys, will be about 45½ miles long. It is stated that as the construction of the line will greatly shorten the distance between the City of Mexico and Tampico, that fact will likely have an important bearing on the early completion of the work. There will be a large local traffic as soon as the line is opened.

Mexican Interoceanic.—The formal transfer of the road from Delfin, Sanchez & Co., of the City of Mexico, to the English company has been effected, in accordance with the provisions of the construction contract made before the issue of the debentures and stock of the company.

Mexican Roads.—The track is being laid on the road now building between Cedral and Potrero. The work has been completed to near Potrero. The line is to reach many of the Catorce mines and connect with the smelters in neighboring cities.

Mobile & Girard.—The tracklaying on the Troy extension is reported to have been suspended. The cause of the trouble has not been published, and it is believed to be only temporary. The track has been laid for over 21 miles south of Troy, Ala., and the line has been graded for 50 miles to the terminus at Andalusia.

Montreal & Western.—It is expected to extend train service very soon from Ste. Sauveur north to Ste.-Adele, about 20 miles from St. Jerome, the southern terminus of the line. The last 20 miles of the line along the east bank of the river is being ballasted. The terminus is to be at Le Desert, Que., 70 miles from St. Jerome.

New Roads.—A meeting of citizens of Staunton, Va., was held last week, at which a committee was appointed to confer with the Norfolk & Western in regard to the construction of a road from Staunton southeast to a point on the Shenandoah Valley near Stuart's Draft, a distance of 11 miles.

Peninsular of Lower California.—The Government of Mexico has accepted the plans for the line north from San Quentin, and grading as far as Colnett, Mex., has begun. Mr. R. A. Graham, of San Diego, Cal., as already stated, has the contract for building the line between San Quentin and Colnett, and also for work to the value of $150,000 in San Quentin Bay. The steamer with material from England for the line, including rails and fastenings for 18 miles, a locomotive, 10 platform cars, steam derricks, etc., arrived at Ensenada, July 24. The locating survey from Tia Juana, Lower California, south to a connection with the line north from San Quentin was commenced July 24, under W. Z. Earle, Chief Engineer. The construction of the roadbed is already in progress at the southern end of the road.

Perry County.—Grading has been recently commenced on the extension from New Bloomfield southwest to Landisburg and Loysville, Pa., a distance of about 12 miles. The road is now in operation between Duncannon, on the Susquehanna River, and New Bloomfield, making the mileage of the line, when the new extension is completed, 23 miles. The line beyond New Bloomfield is to extend in a southwesterly direction, passing through Elliottsburg, Green Park and Landisburg, connecting near Loysville with the Newport & Sherman's Valley road. It is intended to extend the road west from Loysville next year. The extension now being built will be completed about Nov. 15.

Plymouth & Bourne.—The survey recently begun at Plymouth, Mass., is now about half completed. The survey is being made from the terminus of the Central Division of the Old Colony, in the village of Plymouth, through the town of Plymouth and south across Plymouth County, following the shore line to a connection with the Cape Cod Division of the Old Colony line in the town of Bourne. The length of the line is about 15 miles, and there is a good prospect of its being completed this year. The company expected to have the grading in progress now, but no time has yet been set for letting the contract for building the line. The maximum grades are 52.8 ft. per mile, and the maximum curves three degrees. The excavation is all fine sand and gravel. There will be about 3,000 ft. of pile bridging, but no iron bridges. The town of Plymouth has voted to take $75,000 of the capital stock of the company, but the other financial arrangements have not been made public. W. A. Nye, of Bournedale, Mass., is President, and Charles M. Thompson, of Sandwich, Mass., is Chief Engineer.

Port Arthur, Duluth & Western.—The contractors have about 650 men at work on the line between the Minnesota State line and the head of Whitefish Lake, Ontario. The road has now been completed for a distance of 55 miles southwest of Port Arthur, Ont., 13 miles of the track beyond Stanley having been laid this year. The grading is moderately light, the maximum grade being 66 ft. per mile and the maximum curve seven degrees. The road is now in operation from Port Arthur, through Fort William, at the head of Lake Superior, to a point near Stanley. The road passes through the silver mining region and then enters the iron region to Whitefish Lake. Passing to the north of Whitefish and Arrow lakes it follows a chain of small lakes to the Minnesota boundary line at Gunflint Lake Outlet. It is expected to have the line ballasted as far as this point this season. It is proposed to extend the road into Minnesota next summer to secure a part of the iron traffic.

Seattle & Montana.—The track is now laid through Mukilteo and Marysville to a point near the Stillagua Mist River, a distance of about 54 miles north of Seattle. Recently the contractors have begun to lay the track south from Jarman Prairie to the Stillagua Mist River, a distance of about 30 miles. Jarman Prairie is the northern terminus of the line, where the road connects with the Fairhaven & Southern. About a mile and a half of track is being laid daily on the road. Several times over two miles has been laid in a day.

Sebasticook & Moosehead Lake.—The prospects of the extension from Hartland north to Athens, Me., being built this year, are said to be improving. The line is about 10 miles long, and was chartered by the Maine Legislature in the spring. The towns have voted subsidies, but it is proposed to issue a new mortgage on the entire line before work is commenced.

Silver City & Northern.—Nearly all of the road between Whitewater and Georgetown, N. M., is reported completed. The end of track is at present at Hanover, about 18 miles northwest of Georgetown, and it is proposed to open the road to the mines at this place at once. Most of the mining claims at this place are owned by the company.

Southern Pacific.—The ballasting is more than half completed on the extension south to Armona, Cal., from Los Banos. The work now in progress is on the 58 miles between Firebaughs and Armona, on which the track was laid this year. The line has been operated between Los Banos and Firebaughs, 30 miles, for some months.

Velasco Terminal.—The company was incorporated in Texas last week. It proposes to construct a road about 40 miles long from Velasco, at the mouth of the Brazos River, up the Brazos River to Arcola, in Fort Bend County, Tex. The capital stock is $600,000. The incorporators are: Abner Taylor, G. Wilke, N. W. Anderson, all of Chicago; L. E. Degee, Frank Caldwell and F. W. Vaugn, of Velasco, Tex.; also W. D. Lee and J. M. Ferguson, of Leavenworth, Kan., and G. W. Angle, of San Antonio, Tex.

Wabash Transportation Company.—This company was last week incorporated in Illinois to build a subway under Wabash avenue in Chicago for an underground railroad. The capital stock is $10,000,000. The incorporators and board of directors are George W. Cole, Silas Rhodes, J. Warren Pease, Maria E. Beasley and Pleasant Amick.

Wadena & Park Rapids.—It is reported that the road has been completed to Park Rapids, Hubbard County, Minn., opening up a rich country, which is for part of the distance a prairie, but largely timber land. The report probably slightly anticipates the progress of the work, however. The road is 55 miles long from Eagle Bend north to Park Rapids, and 31 miles of track had been laid July 15.

GENERAL RAILROAD NEWS.

Alabama Midland.—A bill was filed in the Chancery Court of Alabama, Ala., July 31, by the Alabama Terminal & Improvement Co., praying for the appointment of a receiver for the road. The chief ground of the application is the default of interest in May last. It further asserted that the object of the present management is to lessen the value of the road's securities so that present holders may be forced to transfer them to H. B. Plant and others now operating the road. The chancellor has fixed Aug. 11 for a hearing.

Atchison, Topeka & Santa Fe.—The gross earnings, operating expenses (exclusive of taxes and rentals) and net earnings of the road and its auxiliary lines for the year ending June 30, 1891, were as follows:

	Gross earn.	Oper. expen.	Net earn.	Oper. mile.
Roads owned and controlled	$31,912,266	$22,305,825	$9,636,441	6,527
Roads jointly owned	1,721,450	1,737,344	Cr. 15,894	584
Total Atchison system	$33,663,716	$21,043,169	$9,620,547	7,111
St. Louis & San Francisco.				
Roads owned and controlled	$6,748,508	$3,840,858	$2,907,649	1,329
Roads jointly owned	1,685,207	1,669,681	15,526	531
Total Frisco system	$8,433,715	$5,510,539	$2,923,176	1,860
Aggregate both systems	$42,097,431	$29,553,708	$12,543,723	8,971

The comparative statement of all lines is as follows:

			—Per mile.—			
Atchison System.	Gross earnings.	Net earnings.	Gross earnings.	Net earnings.	Mileage.
Year 1891	$33,663,716	$9,620,546	$4,735.63	$1,352.95	7,111
Year 1890	31,004,357	10,083,971	4,360.09	1,418.09	7,111
Inc. or Dec.	I. $2,659,359	D. $463,425	I. $373.54	D. $65.14	....
Frisco System.					
Year 1891	$8,433,716	$2,923,176	$4,534.67	$1,571.74	1,860
Year 1890	7,869,306	3,120,231	4,241.37	1,681.73	1,855
Inc. or Dec.	I. $564,410	D. $197,055	I. $293.30	D. $109.99	I. 5
Aggregated General System.					
Year 1891	$42,097,431	$12,543,723	$4,692.39	$1,398.19	8,971
Year 1890	38,873,662	13,204,202	4,335.52	1,472.64	8,966
Inc. or Dec.	I. $3,223,768	D. $660,479	I. $356.87	D. $74.45	I. 5

The earnings for June were:

Atchison, Topeka & Santa Fe.	Gross earn.	Oper. expen.	Net earn.	Oper. milea'e
Roads owned and controlled	$2,678,163	$1,851,122	$826,981	6,527
Roads jointly owned	163,032	160,382	7,650	587
Total Atchison system	$2,846,195	$2,011,561	$834,631	7,114
St. Louis & San Francisco				
Roads owned and controlled	$544,973	$328,038	$216,935	1,327
Roads jointly owned	165,235	154,202	11,033	536
Total Frisco system	$710,203	$482,240	$227,968	1,863
Aggregate both systems	3,556,403	2,493,804	1,062,599	8,977

The following is the comparative statement of all lines:

			—Per mile—		
Atchison System.	Gross earn.	Net earn.	Gross earn.	Net earn.	Mileage.
June, 1891	$2,846,195	$834,631	$400.06	$117.32	7,114
June, 1890	2,523,543	552,271	354.92	77.68	7,110
Inc. or Dec.	I. $32,652	I. $382,360	I. 45.14	I. $39.64	I. 4
Frisco System.					
June, 1891	$710,208	$227,969	$381.28	$122.33	1,862
June, 1890	593,366	169,696	319.81	91.46	1,855
Inc. or Dec.	I. $116,842	I. $58,272	I. 61.47	I. $30.87	I. 7
Aggregated General System.					
June, 1891	$3,556,403	$1,062,600	$396.16	$118.36	8,977
June, 1890	3,116,909	721,968	347.65	80.52	8,965
Inc. or Dec.	I. $439,494	I. $340,632	I. $48.51	I. $37.84	I. 11

Boston & Albany.—The statement of the operations of the road for the quarter ending June 30, and for the fiscal year, filed with the State Railroad Commissioners, is as follows:

Three Months—April 1 to June 30.	1891.	1890.	Inc. or Dec.
Gross earnings	$2,312,448	$2,283,042	I. $29,406
Operating expenses	1,612,595	1,161,351	I. 451,244
Net earnings	$669,852	$1,121,690	D. $451,838
Fixed charges	188,493	192,828	D. *4,335
Balance	$481,358	$928,862	D. $447,504
Twelve Months—July 1 to June 30.			
Gross earnings	$9,177,893	$9,137,045	I. $40,848
Operating expenses	6,235,221	5,789,355	I. 445,866
Net earnings	$2,942,672	$3,347,689	D. $405,018
Fixed charges	1,330,876	1,328,273	I. 2,603
Balance	$1,611,794	$2,019,416	D. $417,62

Cambria & Clearfield.—Notice was filed in the Secretary of State's office at Harrisburg, Aug. 5, of the consolidation and merger of the Cresson Road and the Cambria & Clearfield Co. J. N. Dr. Barry, President of the latter corporation, which is operated by the Pennsylvania, is the President of the merged roads.

Canadian Pacific.—The company reports gross earnings for June of $1,006,481, an increase of $163,303 as compared with the same month of last year, and net earnings of $601,812, an increase of $53,697. For the six months ending June 30 the gross earnings were $9,031,454 an increase of $1,657,112 as compared with the corresponding period of last year, and net earnings were $2,954,522, an increase of $731,148.

Charleston, Cincinnati & Chicago.—The Boston Safe Deposit & Trust Co., of Boston, Mass., has begun a suit against the road in the United States Court at Covington, Ky., for $7,345,000. In 1887 the railroad executed a mortgage to the Boston Trust Co. on its road between Charleston, S. C., and Ashland, Ky., for $25,000 a mile. The Trust company claims that the railroad company is insolvent and asks for the sale of its property to pay its claim.

In the United States District Court at Greenville, S. C., Aug. 4, Judge Simonton ordered the receiver to issue receiver's certificates to the amount of $230,897 to pay the claims of the creditors.

Chesapeake & Ohio.—The company reports gross earnings for June of $680,815, and net earnings of $171,118, an increase of $157,118 as compared with the same month of last year.

Chicago, Milwaukee & St. Paul.—The city attorney of Milwaukee, Wis., has been instructed to apply for a writ of mandamus to compel the company to remove 28 of its 32 tracks, which the city claims have been illegally laid across Muskego avenue, if the company refuses to build a viaduct at that avenue. This action on the part of the city is because the company has refused to contribute more than $100,000 of the $200,000 which the city demanded toward building the proposed viaduct across the Menominee Valley at Sixteenth street.

Concord & Montreal.—In the injunction case of the Boston & Maine against this road to restrain the latter from constructing the extension from North Weare to Henniker, N. H., 6½ miles, the Supreme Court of New Hampshire has rendered a decision making the injunction perpetual and holding that there is no transfer of legislative authority which permitted the Concord & Montreal to build the extension.

East Tennessee, Virginia & Georgia.—The company has filed a bill in chancery at Chattanooga, Tenn., for the sale and partition of the Union Station. The defendants are the Nashville, Chattanooga & St. Louis, Western & Atlantic, and Memphis & Charleston roads, and the State of Georgia as the owner of the Western & Atlantic. The bill questions the right of Memphis & Charleston to its claim of one-fourth interest on the droperty, and asks the court to decide that question. The East Tennessee has withdrawn its trains from the Union Station and is now using the Central Station of the Queen & Crescent.

Fort Scott Central.—The articles of incorporation for the company were filed in Kansas last week. The company has been formed by a consolidation of several short Missouri lines of the Missouri Pacific, as already described. The capital stock is $2,000,000.

Fort Smith, Paris & Dardanelle.—A petition asking that the road be placed in the hands of a receiver was filed in the Circuit Court at Fort Smith, Ark., July 31, upon the application of M. Fickenger, a director of the road.

Gettysburg & Harrisburg.—At a meeting of the company held in Philadelphia, July 30, an agreement was adopted for the consolidation with the South Mountain Railway & Mining Co., as previously authorized by the Board of Directors of both companies. As a result of the action the entire line from Carlisle to Gettysburg will be operated by a single corporation. Both lines are controlled by the Philadelphia & Reading. The branch between Pins Grove Furnace and Hunter's Run, Pa., eight miles, is now operated as the Hunter's Run and Slate Belt road.

Kansas City, Chicago & Texas.—In the United States Circuit Court at Kansas City, Aug. 5, the Central Trust Co., of New York, asked for receivers of two of the Winner projects, the Kansas City Bridge & Terminal Co. and the Kansas City, Chicago & Texas Railroad. The Trust Company is the holder of about $2,000,000 of the bonds of the above concerns. This court took the matter under advisement.

Lockport & Buffalo.—The New York, Lake Erie & Western has settled the old claim of the company for overdue rental by a payment of $22,110. This settles all claims against the Erie up to Oct. 1, 1890. After that time it has to pay a yearly rental of $21,000. Of this $9,100 goes into the treasury of the company, and $11,900 will apply on the interest of the bonded indebtedness, which amounts to $170,000.

Louisville & Nashville.—The stockholders of the company subscribed for 27,354 shares of the new stock recently offered to them at 70, and the remaining 20,645 shares have been taken by a syndicate at the same price at which the stock was offered to the shareholders, less a commission of one-half of one per cent.

Milwaukee, Lake Shore & Western.—The road reports gross earnings for the six months ending June 30 of $1,544,271, a decrease of $217,162 as compared with the corresponding period of last year, and net earnings of $491,434, a decrease of $157,776.

New Orleans & Gulf.—This road, extending from New Orleans to Point a la Hache and Shell Beach, which has been in the hands of a receiver for some time, was sold July 30 for $1,200,000. The purchase was made for the English holders of the first mortgage bonds, and three of the new board of directors are residents of London. It was reported some time ago that the road had been purchased by the Illinois Central, but is to continue an independent line. It is to be reorganized as the New Orleans & Southern.

Northern Pacific.—The contract for filling under 23 bridges on the Idaho Division has been let to J. G. Fairfowl, of Tacoma, Wash. It is thought that the contract will amount to about $120,000.

Oregon Improvement Co.—The company has received from the net earnings for the present fiscal year commencing Dec. 31, $254,000, and has also collected from past due accounts $50,000. In addition to this, $70,000 has been collected on the Pacific Coast. This pays all the interest due next October and December, and half of the interest due next April. The net earnings for the last six months of the last year were $555,000, and it is expected that this year there will be an increase.

Poughkeepsie Bridge Co.—The company has issued $600,000 of coupon five per cent. scrip, due 1901, in lieu of two years' coupons on the first mortgage bonds surrendered under the agreement lately entered into between the bondholders and the Bridge company. The holders of about $3,500,000 of the first mortgage bonds have so far assented to the agreement, and the coupons of $1,500,000 of the bonds have been exchanged for the scrip. The whole loan is $5,000,000.

Texas Grand Trunk.—Attorney-General C. A. Colberson has filed an application for a receiver of the company. There is already a suit pending for the forfeiture of the company's charter for failure to keep the road in good condition.

Tonawanda Valley & Cuba.—The transfer of the title of the road to the purchasers at the recent foreclosure sale has been postponed until Sept. 8 by a temporary injunction. At the sale on July 21 the road was bid in by William Jay and other bondholders, at a price which left certain indebtedness accumulating under the receivership unprovided for, in violation of an understanding with these creditors. The amount is $47,000. The creditors applied for the injunction in Special Term at Rochester, Aug. 1.

TRAFFIC.

Chicago Traffic Matters.

CHICAGO, Aug. 5, 1891.

Chairman Finley has just rendered a decision in the Western Passenger Association involving a novel point of Association law. The Chicago, Rock Island & Pacific on May 8 preferred charges against the Atchison, Topeka & Santa Fe for violation of the agreement in selling a first-class ticket from Chicago to Denver for $28.50, a reduction of $2.15. The Atchison succeeded in establishing to the satisfaction of the Chairman the fact that it received the full tariff rate for the ticket in question, and the case was dismissed. This road then entered a charge against the Rock Island of malicious prosecution, and put in evidence to show that the Rock Island agent visited a large number of brokers' offices in search of such a ticket, admitting that he was particularly anxious to get it, because the Atchison had preferred charges against his road, and he "wanted to get even." Chairman Finley decides that the charge was sustained, and fined the Rock Island $100.

The Chicago & Grand Trunk has withdrawn from the Eastern lines' agreement and is accepting Chicago & Alton tickets. The report that the Grand Trunk, of Canada, has joined in this action is not yet confirmed. The views of the Alton officers seem to be almost neutral; they are jubilant because the boycott has been weakened in even one spot, while at the same time they aver that business is better with than without the "oppression" they are now laboring under.

The harvest excursions are likely to create an unsettled condition in Missouri River rates, notwithstanding all precautions that may be taken.

Chairman Finley decides that the Chicago, Milwaukee & St. Paul and Wisconsin Central did not violate the agreement in selling tickets via Milwaukee from Minneapolis and St. Paul to Toronto and return to the National Educational Association meeting.

Lake and rail grain rates are firm, and notice has been given of an advance in the rate on corn to New England points on Aug. 8 to 9½ cents per bushel. Considerable export corn is now going to Montreal at 6¼ cents a bushel, and wheat at 6¾ cents, being 1 cent lower than to New York. The rates on flour and on 6th-class goods are, however, unsettled. The Anchor line led off with a reduction of 2½ cents, being 17½ cents to New York, 15½ cents to Philadelphia and 14½ to Baltimore, which was promptly met by the other lake and rail lines. The "Soo" line has made an all-rail rate of 17 cents per 100 lbs., Minneapolis and St. Paul to Montreal, on 6th-class.

Vessels are getting better offers at Lake Superior points as well as here, the calls of the rolling mills for more ore being urgent. On ore from Escanaba $1.10 a ton to Lake Erie ports was bid yesterday, an advance of 20 cents a ton in 24 hours.

General Freight Agent Hiland, of the Chicago, Milwaukee & St. Paul, has issued a circular warning the coal dealers on his line that unless they lay in their stock at once they are likely to be seriously inconvenienced by a car famine on account of the large demand for cars to move the grain crop.

The Commissioners of the Western Traffic Association have been called upon to decide a question of considerable importance concerning ticket routing, which originated in this way: The lines running northerly and southerly to and from Denver have been accustomed to sell tickets for Missouri River and other Eastern points, reading from one of said Colorado points via one or more other such points, and thence east by some line connecting with the initial line at such second or third common point; and such tickets are honored by said connecting line not only from the junction point named in the ticket, but also from the original point of sale. For example, a Denver & Rio Grande ticket with a coupon to Colorado Springs or to Pueblo, and thence over a connecting line to Kansas City, might be accepted by the latter line for passage from Denver direct to Kansas City. In such a case the ticket might be used by brokers for the carriage of a passenger to Colorado Springs, and might then be returned to Denver, where it would be available for a passenger from Denver to Kansas City direct; or the purchaser of the ticket might take passage for Kansas City direct without passing through Colorado Springs at all, in which case the selling road would receive the value of the coupon without the performance of any service beyond making the sale of the ticket. In the first method ticket brokers can demoralize revenues, while in the second the connecting line enjoys the advantage of two ticket offices in Denver, one being its own regular office, and the other the office of the Colorado line, the latter receiving for its service the price of a coupon to Colorado Springs in each case, and its agent having an opportunity to collect a commission in addition thereto.

The Commissioners decide that tickets must not be honored so as to perpetuate this irregularity, saying: "No hardship to passengers is perceived in insisting that they pursue the route which they select in the purchase of their ticket, when the first stage of the journey is represented by a coupon to another Colorado point. This requirement would prevent the use of such a ticket by brokers, and would also require the performance of service by the selling road. Any other use is upon its face an irregularity, and destroys the equality of competition among the various lines. It was claimed at the hearing that other irregularities, especially such as are connected with the use of tickets from Denver to distant points in the East over circuitous routes, tend to produce disturbances in passenger business at Colorado points, which are more troublesome and more general than those under consideration. This may be true, but, if true, it affords no reason why the Commissioners should not act upon the case in hand, and thus do something toward the correction of admitted evils."

At the July meeting of the Western Freight Association the Burlington applied for a rate of $2.50 per net ton on hard coal from Chicago to Missouri River points, to expire Nov. 1, on the ground that unauthorized reductions were being made by some of the lines. It is understood that the lines referred to were the Missouri Pacific, which, in connection with the Clover Leaf line, was believed to be manipulating coal rates from Toledo. The application was not granted and an appeal was taken to the Western Traffic Association. The Commissioners, having investigated the complaint, have issued a decision in which they state that they find no sufficient reason for a reduction.

Traffic Notes.

The Southern Mississippi Valley Association held its first meeting Aug. 4, at Monte Sano Hotel, near Huntsville, Ala.

The special agent of the Inter-State Commission was in New York for several days last week with a view, it is said, of getting evidence against the railroads of violating the Inter State law.

The Atchison, Topeka & Santa Fe informs the world that a car load of merchandise has been transported from New York to Los Angeles, Cal., in 11 days. The goods were shipped by Merchants' Dispatch via Chicago.

Chairman Reagan, of the Texas Railroad Commission, states that the Commissioners will probably authorize the suspension of the long and short haul clause of the railroad law in that state between the principal points where there is competition between roads.

Trains of the Chicago, Rock Island & Pacific began crossing the Union Pacific Bridge into Omaha July 31. The Chicago, Milwaukee & St. Paul commenced using the bridge the 30th, and beginning Aug. 16 the Rock Island expects to put on through trains between Chicago and Denver.

The Mahoning and Shenango Valley Car Service Association is moving aggressively against consignees who refuse to pay demurrage. At a large meeting of officials and attorneys of the roads embraced in the association at Youngstown last week, details were arranged for bringing eight or ten suits. The amount of uncollected bills is said to be very large.

Among the numerous low-priced excursions this year, one of the most liberal is that of the Cincinnati, Hamilton & Dayton, giving a $5 round trip from Cincinnati to Niagara Falls, with a stop-over at Detroit for the Grand Army of the Republic parade. A press dispatch states that 4,000 people went, and that the ten trains comprised 42 sleepers and 49 coaches, a total of 91 cars.

Rates on coal between the mines and Atlanta and other important centres in Georgia have been materially reduced. The newspapers say that this is a great victory for the Georgia Railroad Commisson, which threatened to reduce the tariffs within its control if the railroads did not make the desired reduction in interstate rates on coal; but it is not clear from the published accounts whether the present reductions are all interstate and voluntary.

General Passenger Agent T. H. Goodman, of the Southern Pacific, has issued a circular to general passenger agents, giving the history of the suit of Peter S. Peterson, who recovered $25,000 damages from the railroad. The judge charged the jury to render such a verdict. It seems that Peterson bought, sold and afterward repurchased a non-transferable ticket, from which his signature was erased and afterward signed. The conductor, seeing the erasure, refused to allow him passage.

The Northern Pacific and the Union Pacific have agreed upon a reduction of wheat rates in the State of Washington, which the shippers have been loudly clamoring for. A circular issued Aug. 1, taking effect Aug. 10, makes a rate of $5.75 per ton on grain, flour and feed from all points in Washington now taking a rate of $6.50 per ton, to Seattle, Tacoma and Portland. The same rates will be applied from all points on the Central Washington branch from which the rate is now $7 per ton. The Northern Pacific will also reduce the rates from points between North Yakima and Prosser, inclusive, to $4.20 per ton, and from points between Teanaway and Ellensburgh to $3.80 per ton. The average reduction is about 14½ per cent. An officer of the Northern Pacific thinks Seattle should ship from 40 to 50 big shiploads this season, instead of seven, as was the case last season. There is a splendid crop. The reductions made only fall a little short of those contemplated in the bill presented in the legislature.

Albert Nason, Chief Justice of the Superior Court of Massachusetts; Lucius Tuttle, General Manager of the New York, New Haven & Hartford, and J. F. Goddard, Chairman of the Trunk Line Association, acting as referees to construe a traffic contract between the Boston & Maine and the Concord & Montreal roads, decide that the Canadian Pacific Dispatch Line freight does not differ from other business originating on the Boston & Maine; and they further say: It is awarded and determined that the Boston & Maine has the right under the contract of February 1, 1891, to forward Canadian Pacific Dispatch Line freight via White River Junction, instead of via Woodsville and Plymouth. It is also awarded that under said contract the Concord & Montreal has the right to forward freight originating at stations on the line of its road and destined to points south of Nashua Junction by any other route than via the Boston & Maine from Nashua Junction and the cities named in said agreement; and other points similarly situated when reached without connecting with the Boston & Maine, are not included as points south of Nashua Junction within the meaning of said contract.

New York Getting Back its Cattle Market.

The receipts of live cattle at this port have been steadily growing larger every week for months, and now average about 15,000 head a week. The healthy revival of business at Jersey City is shown by the fact that cattle are bringing about $1 per 100 lbs. more than at this time last year, and scores of butchers who for several years back have been purchasing their cattle in the Chicago market are now seen daily at the cattle pens across the river. The cattle are coming from Pennsylvania, Maryland, Virginia, Tennessee, Kentucky, Ohio and Indiana. Last winter the *Tribune* published an extended account [reprinted in the *Railroad Gazette*] of the efforts being made by Allerton, Sherman and others to recover the cattle business of this city, which had slipped away to Chicago. It looks as if the plans of these men, to make New York a great cattle market once more, are about to be realized. One of the features of this revival of the cattle business here is the marked falling off in the receipts at Hoboken. One of the inducements offered to butchers to buy cattle in Chicago was the fact that the Delaware, Lackawanna & Western would, if the beeves were shipped over that line, put them on floats at Hoboken and deliver them free of harbor toll at the foot of East Forty-first street, New York, and North Thirteenth street, Brooklyn. This led to the building of a large and lucrative cattle business over Mr. Sloan's road, as the roads centering at Jersey City—the Pennsylvania, Baltimore & Ohio and Erie—did not offer the same facilities to butchers. Lately this has been changed, and in consequence butchers are going back to Jersey City to buy, and receipts of Chicago-bought cattle at Hoboken are falling off correspondingly. To have New York, a great cattle market is in the interest of every farmer living east of Chicago.—*New York Tribune.*

Conductors Supplanting Express Messengers.

On July 18, M. C. Roach, General Eastern Passenger Agent of the New York Central, ticketed to Tacoma, Wash., a girl about nine years of age, who made the trip with perfect safety. She passed over the New York Central, Lake Shore, Chicago, Milwaukee & St. Paul, and Northern Pacific, with three changes of cars. Mr. Roach gave the little passenger a letter to conductors, who were asked to indorse their names upon the reverse of the letter. This was in the nature of a receipt which when returned bore the indorsement of 22 conductors, and two city passenger agents (at Chicago and St. Paul).

East-Bound Shipments.

The shipments of east-bound freight from Chicago by all the lines for the week ending July 30 amounted to 44,614 tons, against 46,384 tons during the preceding week, a decrease of 1,770 tons. The proportions carried by each road were:

	Wk. to July 30.		Wk. to July 23.	
	Tons.	P. c.	Tons.	P. c.
Michigan Central	4,500	14.6	7,345	15.8
Wabash	3,100	7.0	2,951	6.4
Lake Shore & Michigan South.	5,844	13.1	7,480	16.1
Pitts., Ft. Wayne & Chicago	6,275	14.1	5,443	11.8
Pitts., Cin., Chicago & St. L	5,234	11.7	5,561	12.0
Baltimore & Ohio	3,096	6.9	2,600	5.6
Chicago & Grand Trunk	4,767	10.7	4,405	9.5
New York, Chic. & St. Louis.	5,016	11.2	5,480	11.8
Chicago & Erie	4,872	10.7	5,119	11.0
Total	44,614	100.0	46,384	100.0

Of the above shipments, 1,933 tons were flour, 16,964 tons grain, 2,571 tons millstuff, 4,529 tons cured meats, 7,336 tons dressed beef, 2,020 tons butter, 1,458 tons hides, 376 tons wool and 6,032 tons lumber. The three Vanderbilt lines carried 38.9 per cent., while the two Pennsylvania lines carried 25.8 per cent. The lake lines carried 83,601 tons, an increase of 849 tons.